The Conservation of Habitats and Species Regulations 2017

Bats – Method Statement template to support a licence application

The Method Statement will be used to determine the impact of the proposal on the favourable conservation status (FCS) of the species concerned (Regulation 55(9)(b)).
You are strongly advised to refer to the Bat Mitigation Guidelines.
Please use recent photographs to support your application.

Wildlife Licensing
Natural England
Horizon House
Deanery Road
Bristol
BS1 5AH.
T. 020802 61089

Important advice:

The format below must be used. Please enter text below each heading keeping information as concise as possible.

All maps/figures that will become part of any annexed licence granted must be submitted as separate documents (with the site name and date included on the map/figure. See section I for list – all others may be included within the Method Statement document (e.g. survey maps/figures) if preferred).

A separate work schedule must also be submitted on form WML-A13a-E5a&b to accompany the Method Statement.

A Executive summary

Provide an overview (no more than 1 side of A4) of what works are proposed and how the impacts identified will be addressed in order to ensure no detriment to the maintenance of the population at a favourable conservation status.

This application relates to the data, surveys, assessment, predicted impacts, licensing requirements, proposed mitigation and predicted residual effects on the conservation status of the bat assemblage, individual bats and bat roosts associated with a woodland complex hereafter referred to as the 'Kenilworth sites'. There are four main woodlands where impacts will occur: Birches Wood, Rough Knowles Wood, Broadwells Wood Local Wildlife Site (LWS) and Black Waste Wood LWS. In addition there are a number of ancillary woods and woodland areas. These woodlands are all affected by the construction of the Stoneleigh, Kenilworth and Burton Green section (Community Forum Area (CFA) section 18) of the wider High Speed 2 (HS2) rail infrastructure Scheme (the Scheme'). The proposed HS2 route in section CFA18 is 11 km in length. The 'direct impact zone' is defined as the extent of the LLAU for the construction of the Scheme, where land within the LLAU is to be cleared for construction (some areas of the LLAU will not currently be used or are to be used for habitat creation). The 'indirect impact zone' is the land within which disturbance to bat roosts within trees may occur as a result of the construction of the Scheme. This zone comprises a 20 m buffer around areas of the LLAU where disturbing construction works will occur.

Summary statistics for the licence area are presented in Table A1 below:

Table A1. Licence area summary statistics

Kenilworth - woodlands within the licence area (main sites in bold)	Area of Woodland (ha)	Impact Zones		
		Woodland directly impacted (lost)	Woodland Indirectly impacted (20m buffer)	Area not impacted
Little Poors	1.41	0.15	0.47	0.79
Black Waste	12.82	2.05	0.33	10.44
Broadwells Wood	17.32	4.30	2.86	10.16
Roughknowles	5.07	0.41	1.01	3.65
Birches Wood	0.62	0.62	0.00	0.00
Crackley Wood	21.67	0.97	0.49	20.21
Big Poors	3.26	0.00	0.18	3.08
Other small unnamed portions of woodland	4.02	3.39	0.40	0.23

Total	**66.19**	**11.89**	**5.74**	**48.55**

[See Figure B2.1- Master Plan Overview and Figure C5a – Location Map]

Advanced licence bat surveys were undertaken in 2018 and 2019, along with visual inspections of trees within the LLAU. The purpose of the surveys was to confirm the assemblage of tree roosting bat species using the woodland during the survey period and to identify any roosts. The data have been used to formulate a risk assessment of bats likely to be present during tree felling works, to allow a licence to be sought and appropriate mitigation and safeguarding measures prescribed. Given the highly mobile behaviour of tree roosting bats, any of the bat species found during the surveys could be roosting at the site at other times of the year. The data also allows the Kenilworth sites to be assessed for its importance as a roosting resource for bats.

The surveys have confirmed the presence of eight species of bat using the licence area for roosting and foraging. Prior to mitigation, the predicted impacts of the Scheme on the bat assemblage at the Kenilworth sites comprise:

- The **permanent loss** of 11.89 ha of ancient and mature woodland with the **permanent loss of trees** identified as having Potential Roosting Features (PRFs): approximately 800 of low, 584 of moderate and 107 of high potential to support roosting bats;
- **Direct impacts** to ten known tree roosts, including maternity and day roosts for brown long-eared bat, Natterer's bat and unknown roost types for common pipistrelle and soprano pipistrelle bats;
- **Indirect impacts** comprising alterations of conditions to seven roosts **(**maternity, day or unknown) for brown long-eared bat and Natterer's bat;
- **Indirect impacts** comprising alterations of conditions to 5.74 ha of woodland with 438 trees identified as having PRFs: approximately 220 of low, 141 of moderate and 49 of high potential to support roosting bats.

In the absence of mitigation, it is anticipated that the combination of these impacts will lead to an adverse effect on the conservation status of the assemblage of bats at the Kenilworth sites that may be significant at up to the District level for the bat assemblage present.

The inherent design of the HS2 scheme has been refined to avoid effects on bats resulting from habitat fragmentation and other indirect impacts. Through the Kenilworth sites licence area, the design features include the Burton Green tunnel which will ensure connectivity between Black Waste Wood with Big Poors and Little Poors is retained.

To address the remaining impacts of tree and vegetation clearance in this location on bats, the following will be implemented:

- Roost mitigation features for the direct loss and indirect impacts on maternity and day roosts for four different species of bat and for directly impacted high and moderate PRF trees, as per Table A2 below:

Table A2. Details of roosts and PRFs to be lost and number of replacement features required

Bat Species	Conservation Value	Directly affected	Indirectly affected	Compensation ratio	Minimum roost mitigation features required
M. nattereri	Low	3	2	2:1	10
M. nattereri	Moderate, High or Unknown	0	2	4:1	8
P. auritus	Low	0	1	2:1	2
P. auritus	Moderate, High or Unknown	5	2	4:1	28
P. pipistrellus	Moderate, High or Unknown	1	0	4:1	4
P. pygmaeus	Moderate, High or Unknown	1	0	4:1	4
NA	Moderate PRF trees	584	NA	1:2	292
NA	High PRF trees	107	NA	1:1	107
Total	All	701	7		**455**

- Felling activities will place outside the bat hibernation season as per the Works Schedule and Appendix A.
- All pre-felling climbing surveys / works will be undertaken by suitably qualified ecologists with Level 2 Class licences that are accredited agents approved by the Named Ecologist for the Mitigation Licence. All activities will be supervised by an Ecological Clerk of Works (ECoW Site Supervisor) approved by the Named Ecologist, and all works, actions and bats encountered will be fully documented;

- In accordance with the detailed methodologies in Section E and Appendix B of this Method Statement, moderate and high potential trees will be climbed, PRFs inspected and then the trees will be felled. Low potential trees will also be climbed and inspected at the discretion of the ECoW site supervisor / accredited agents where this is deemed to be required. Any roosting bats will be removed (in line with process E.2.2 (NE capture and release procedures a-h)) or one-way valves fitted to allow exit but not re-entry. Trees are anticipated to be felled within 24 hours of climbing inspection. Trees with PRFs will be prioritised for felling first;
- The loss of any additional confirmed roosts discovered during bat rescue inspections will be compensated for through the provision of additional bat boxes, or similar mitigation features, at a ratio of 2:1 for non-Annex 2 species day roosts, at a ratio of 4:1 for non-Annex 2 species maternity and hibernation roosts, and at a ratio of 4:1 for Annex 2 species;
- All bat boxes will be erected under supervision of the ECoW Site Supervisor approved by the Named Ecologist;
- Post-mitigation monitoring will be undertaken and will consist of bat box inspections and further trapping and radio tracking surveys to assess mitigation effectiveness against the bat assemblage baseline established prior to clearance. This work will be undertaken by accredited agents approved by the Named Ecologist to ensure consistency in monitoring survey methods employed pre- and post-mitigation.
- Habitat management will be undertaken of retained woodland at Black Waste Wood specifically to benefit the local bat assemblage, including creation of approximately 207 PRFs through veteranisation over the first 15 years following tree felling; and
- Creation of approximately 21.4 ha of new woodland and scrub habitat joining the remaining woodlands within the licence area over time (see Figure E3B for an overview of the habitat creation and connectivity for bats). Manual veteranisation of new trees at 30 years will create another 176 PRFs, along with natural formation of further veteran tree features on 0.3ha of fruit tree planting at Roughknowles.

Due to the large areas over which bats forage, the loss of, or displacement of bats from, suitable foraging habitat at the Kenilworth sites will amount to only a small proportion of the wider available foraging resource given the adjacent extensive woodlands in the vicinity and the presence of the tunnel which limits wider tree removal. Consequently, it is not considered that the loss of foraging habitat associated with tree and vegetation clearance at the Kenilworth sites will result in any significant adverse effect on the local bat assemblage.

Following implementation of the above measures, it is considered that any adverse impacts on bats resulting from the clearance of vegetation and trees in this specific area of the Scheme will be reduced to a level at which they will not result in any significant effect on the favourable conservation status of the species concerned. There will be medium-term adverse effects whilst the new woodlands become established and mature, which could be over a period of 50 years.

B Introduction

B1 Background to activity/development:

Include a brief summary of:

- Why the activity and a licence are necessary (*e.g. bridge structure repairs are required and will affect a known maternity roost of Daubenton's bats, which will be temporarily lost whilst works are being undertaken; renovation works to an office building will result in the permanent loss of three day roosts of common pipistrelle bats; demolition of an existing hospital to be replaced with flats will result in the loss of a brown-long eared bat maternity roost*).

In order to facilitate the construction of the HS2 Scheme, extensive clearance of ground and vegetation, ground investigation (GI) works and associated construction works are necessary throughout the extent of the LLAU of the Scheme. The LLAU comprises the route of the railway, its associated access tracks, construction areas (including those associated with planned mitigation schemes and structures) and compounds.

The LLAU runs through habitats which will be affected by the construction and/or operation of the Scheme. This is the case with the woodlands within the licence area, which will require clearance of woodland including some areas of Ancient Semi-natural Woodland (ASNW) to facilitate the Scheme. Figure Da Impacts Plan shows the areas that will be cleared within the licence area.

These clearance works will result in the loss of known and assumed bat roosts of both high and low conservation value, as well as the loss of a number of potential roost features. There is also a risk to individual bats during felling works. Removal of surrounding habitat will cause the alteration of conditions around existing

bat roosts up to 20 m from the clearance works (20 m being the agreed buffer for the Scheme, see Section D1 for further details). Without mitigation and licensing, the construction phase of the Scheme could not proceed.

The operational phase of the Scheme represents a risk of disturbance (alteration in the immediate environment due to noise, light and vibration associated with the running of trains) to any retained roosts within 20 m of the operational boundary of the Scheme, and to individual bats during the operational phase of the scheme through severance of commuting routes and / or direct mortality through collision of bats with trains.

Species known to be present in the Kenilworth sites and their immediate vicinity (the species at risk of disturbance and mortality) are common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*P. pygmaeus*), noctule (*Nyctalus noctula*), Leisler's bat (*N. leisleri*), Natterer's bat (*Myotis nattereri*), Brandt's bat (*M. brandtii*), whiskered bat (*M. mystacinus*) and brown long-eared bat (*Plecotus auritus*). Not confirmed through the trapping and tracking surveys but potentially also present are Daubenton's bat (*M. daubentonii*), serotine (*Eptesicus serotinus*) and Nathusius pipistrelle (*P. nathusii*) as flagged by historic transect and static logger surveys.

As such, a robust mitigation scheme is required comprising replanting, screening, roost replacement and general mitigation measures for the timing and methodology of tree felling.

- Include current status of planning permission (if applicable) *e.g. full planning permission with all relevant wildlife conditions discharged; permitted development; demolition with prior notification of demolition issues resolved*. If the proposal is for demolition only of a structure supporting a bat roost/s, please confirm whether there are plans to develop the site in the future and if so when.

N/A

B2 Relationship with other nearby development and cumulative impacts

B2.1 Is the current application part of a larger development project? For example, is it part of a phased or multi-plot housing development that will require more than one bat licence? Enter Yes, No or N/A in the text box below. If yes, note a separate ***master plan*** document will be required.

Whilst it is a phased development in the construction sense, it is not in a licensing sense, as the most significant licensable activities on the bat populations will take place at the same time.

The licence area forms part of the HS2 Scheme. See 2013 HS2 Environmental Statement, which refers to the HS2 development as a whole, and the CFA18 report and map book which refer to the specific area to which this method statement pertains.

With regard to works for HS2, there are a number of Bat Low Impact Class Licence (BLICL) areas in the vicinity, although only one currently licenses impacts to bats. These are detailed below. The licence covers a small number of individual bat day (summer) roosts that occur in individual trees within tree lines and hedgerows which are in ecological connectivity to the Kenilworth sites licence area. These bats are likely to use the woodlands onsite for foraging and roosting, and are considered likely to form part of the bat population using the licence area. As such therefore given the low numbers, the presence of other retained woodlands and trees in the area providing alternative foraging and roosting options, the cumulative impacts are not considered to exceed those detailed within the licence.

Bat Licence	Species on Licence	Date of Licence Start	Date of Licence End	Licence for?	Case reference	Closest distance from licence area (Km)
BLICL01	C.pip, S.pip, Noc, BLE	Jul-19	Jul-24	Destruction of tree roosts (Day roosts)	B40RC008-HS2-2A	0.3 (E)
BLICL10 (Retired)	Nothing to licence currently	N/A	N/A	N/A	N/A	Adjacent (E)
BLICL11 (Retired)	Nothing to licence currently	N/A	N/A	N/A	N/A	Adjacent (W)
BLICL24 (Retired)	Nothing to licence currently	N/A	N/A	N/A	N/A	0.4 (W)

BLICL28 (Retired)	Nothing to licence currently	N/A	N/A	N/A	N/A	Adjacent (N)

Stoneleigh Park is located approximately 3.2km to the south-east from the Kenilworth sites licence area, and is also subject to an EPSL application for tree felling and loss of roosts along with demolition of building roosts. Although open countryside lies between Stoneleigh and the Kenilworth licence area, connectivity is somewhat impacted by the presence of roads. There are significant areas of woodland, trees and hedgerows in the surrounds of Stoneleigh Park along with historic settlements, providing both alternative roosting and foraging provision in the immediate vicinity for bats impacted by works at Stoneleigh. These are much better connected to the impacted area at Stoneleigh than the Kenilworth woodland complex. Overall, the potential for cumulative adverse impacts has been considered and dismissed, as these are not considered to be significant.

Important Advice: If yes to the above, please note that sections in this Method Statement on impact assessment and mitigation measures must explicitly relate *only* to impacts from the works currently proposed.

A project-wide master plan must detail the overall impact assessment and mitigation and explain where, and why, each of the bat licences will be required. The master plan must be included as a separate document to this application: see http://www.naturalengland.org.uk/Images/WML-G11_tcm6-9930.pdf for details that are to be included in this separate document. The separate master plan is expected to take due regard of the overall project to ensure that in-combination effects are considered, and mitigation and compensation measures are both sufficient and coherent.

If the current development is part of a larger development project, summarise very briefly here how the current application relates to the larger project and how the in-combination effects are considered and mitigation/compensation is sufficient.

The Scheme is part of the wider HS2 project. A full assessment of the cumulative impacts for committed and proposed developments in the vicinity of the full length of the Scheme (including the Kenilworth sites licence area) was undertaken as part of the HS2 Environmental Statement in 2013, which (along with its technical appendices) lays out detailed assessment of cumulative / in-combination effects, provides plans for mitigation and assesses the residual effects on a taxon-specific / habitat-specific basis.

As part of drafting this method statement, key facts have been taken from the HS2 ES which outlined the ecological baseline at the time, and from subsequent updates / publications (where they exist relevant to the site). There are no significant changes to report regarding the ecological baseline in this location relative to that reported in the ES. The ES has been consented and the associated mitigation and compensation therefore assessed as being proportionate and appropriate.

The design of the Scheme and associated construction and logistics planning has continued to be developed since the original ES. In due course there will be a Schedule 17 application (with Written Statement) for the detailed final design of the Scheme through the Kenilworth sites including such details as earthworks and fencing with a master plan. This work is undertaken at the Main Works Stage of the Scheme and therefore has not yet been produced. The controls contained in the Environmental Minimum Requirements (EMR), along with powers contained in the High Speed Rail (London - West Midlands) Act ('the Act') and the Undertakings and Assurances given by the Secretary of State, will ensure that impacts which have been assessed in the ES (as amended) will not be exceeded. EMR compliance is ensured through the EMR compliance review process, which is an integral part of the design process. The outcome of this process is the production of EMR compliance reports which provide in the context of the Phase One EMRs, the outcomes of a review of whether the developed design or changes to the associated construction and logistics activities, is likely to result in environmental impacts which exceed those reported in the ES (as amended). An EMR compliance report will be produced with the results of this review which will be updated at the end of the Scheme Design process and again during Detailed Design. Any additional impacts on bats will identified during this process. At this stage any outstanding Environmental Site Management Plans (ESMP) will be produced (those for the initial compensatory habitats have already been produced (or are in production) at the Early Works Stage which is the stage of works at the time of writing of this licence application. The ESMPs for the Main Works will be produced subsequently, these will ensure the long-term management of compensatory habitats and mitigation measures required as a result of the detailed design, including such features as cuttings and viaducts whereby impacts on the Favourable Conservation Status (FCS) of bats (if identified) may be required to be monitored. As such, it is considered that monitoring of construction impacts of the Scheme beyond the tree clearance does not form part of this Licence Application.

Important Advice: to accompany this Method Statement also include Figure. B2.1 for a Master plan overview - and see section I "Map checklist" at the end of this document.

B2.2 Apart from any mention in B2.1, please inform us of any past or future development or other projects (in the last 5 years or next 5 years) in the vicinity which may have significantly impacted or are likely to significantly impact on the same population/s of bats as this application (e.g. loss of maternity or hibernation roosts). You must make reasonable efforts to establish this, including discussions with your client and the Local Planning Authority – stating below what you undertook. A brief summary of the project/s should be provided including the site name and location, dates and if known the licence reference number(s).

Please note we are not expecting details of every licence/planning permission issued within the vicinity of the site – we are only concerned with projects that have the potential to significantly impact or have impacted on same population of bats (maternity and hibernation roosts). Note: Natural England is aiming to make available licensing records from the last 5 years publically available.

A search of the MAGIC website (https://magic.defra.gov.uk – website last updated in May 2019 as at 27/01/2020) found 13 licences for the destruction of breeding and resting sites for bats within 5 km of the woodlands within the Kenilworth licence area. The closest is 0.6 km distant dating from 2014; and the most recent dated licence is from 2015 (expiring 2020). These are detailed below. The impacts from these licenses to bats using the Kenilworth sites will have already occurred and as such will not exacerbate impacts from the tree felling works at Kenilworth (and so will not result in cumulative effects).

Kenilworth Licence Area - closest woodland	Species on Licence	Date of Licence Start	Date of Licence End	Parish	County	Licence for?	Case reference	Closest distance from licence area (Km)
Rough Knowles	Brown Long Eared and Common Pip	7/4/2014	30/09/2015	Burton Green CP	Warwickshire	Destruction of a resting place	2014-178-EPS-MIT	0.6
Black Waste	Common pip, Soprano pip, BLE	2/8/2013	30/09/2014	Burton Green CP	Warwickshire	Destruction of a resting place	EPSM2013-6055	0.9
Rough Knowles	Brown Long Eared, Common pip and Soprano pip	15/01/2015	31/01/2020	Burton Green CP	Warwickshire	Impacts and destruction of breeding and resting sites	2014-4568-EPS-MIT	1.3
Black Waste	Brown Long eared	29/09/2015	1/9/2020	Balsall CP	West midlands	Destruction of a resting place	2015-14267-EPS-MIT	2.4
Broadwells	Common Pip	11/5/2012	1/8/2016	Kenilworth CP	Warwickshire	Destruction of a resting place	EPSM2011-3723	2.6
Birches Wood	Common Pip, Soprano Pip	3/3/2015	26/02/2020	Kenilworth CP	Warwickshire	Destruction of a resting place	2015-7293-EPS-MIT	2.8
Broadwells	Brown Long eared	11/9/2012	20/07/2013	Berkswell CP	Warwickshire	Destruction of a resting place	EPSM2012-4583	4.1
Broadwells	Common Pip	1/9/2014	30/04/2015	Balsall CP	West midlands	Destruction of a resting place	2014-2351-EPS-MIT	4.3
Broadwells	Common Pip	2/3/2012	1/6/2015	Non-Civil Parish or Community	West midlands	Destruction of a resting place	EPSM2012-4049	4.4
Broadwells	Brown Long eared	8/5/2013	1/10/2014	Balsall CP	Warwickshire	Destruction of a resting place	EPSM2013-5830	4.5

Broadwells	Common Pip	1/4/2011	30/09/2012	Balsall CP	West midlands	Destruction of a resting place	EPSM2011-2899	4.8
Birches Wood	Common Pip, Brown Long eared	1/8/2011	1/7/2012	Ashow CP	Warwickshire	Destruction of a resting place	EPSM2011-3252	4.8
Broadwells	Brown Long Eared	20/12/2011	30/06/2012	Beausale, Haseley, Honiley and Wroxall CP	Warwickshire	Destruction of a resting place	EPSM2011-3775	4.8

A search of planning records (updated on 30/01/2020) found no relevant planning applications within a 5 km radius of the Kenilworth sites where bats would be affected by current planning applications or which have been approved but not yet started.

Cumulatively and in conjunction with the impacts from the development of the HS2 scheme, it is not considered that the existing licensed development and planning applications will have an adverse impact on the bat populations within the Kenilworth sites.

Important Advice: locations of other bat mitigation sites that may have significantly impacted or are likely to significantly impact on the same population/s of bats as this application must be shown on Figure B2.2.

C Survey and site assessment (also see section 5 of the Bat Mitigation Guidelines)

C1 Pre-existing information on the bat species at the survey site:
Please undertake a historical data search within a 2km search radius and provide a summary of the results of this search. For example, records from local environmental records centres, local bat groups and previous survey work undertaken at the site is all relevant. Please briefly comment on the results in relation to your project/site

- Should no historical records be found from your search please state this – and specify what searches you undertook.
- Note that you must not include records from National Biodiversity Network (NBN) without first obtaining written permission from the relevant Data Provider.

Baseline / Historical Data (to 2013):

The following historical data was provided from the HS2 Environmental Statement (ES) and was used to support subsequent further survey work.

Records Search

In 2012, a desk study was undertaken to inform the HS2 ES. It is not possible to provide the source data for the desk study as this was not published along with the ES, however a summary of the data was provided in the ES which has been reproduced here. Information from Warwickshire Biological Records Centre (WBRC) identified the presence of ten species of bat within 10 km of the route of the Scheme within the Stoneleigh, Kenilworth and Burton Green area. These species were common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*P. pygmaeus*), noctule (*Nyctalus noctula*), Leisler's bat (*N. leisleri*), Daubenton's bat (*Myotis daubentonii*), Natterer's bat (*M. nattereri*), Brandt's bat (*M. brandtii*), whiskered bat (*M. mystacinus*), serotine (*Eptesicus serotinus*) and brown long-eared bat (*Plecotus auritus*). No designated sites relating to bats were identified within 10km.

Through consultation with Natural England ([redacted], 4th April 2019) it has been agreed that further desk study data are not required for the purpose of this application, given the robust nature of the survey data provided by the survey techniques used to support this licence application.

Roosts and Trees

During initial tree assessments, 313 trees were recorded within the LLAU of the Stoneleigh, Kenilworth and Burton Green (CFA18) section of HS2. Of those, 36 trees were found to contain features with a high suitability to

support roosting bats and 130 trees found to contain features with a moderate suitability to support roosting bats. No confirmed roosts were identified.

[See Figures EC-05-049 and EC-05-050a from HS2 London-West Midlands Environmental Statement Volume 5 Map Books: CFA18 Kenilworth and Burton Green (Ecology) [Bat Roosts]

Field Surveys

CFA18 survey data is not separated based on woodland site. Therefore, the following survey data should be considered an overview of the bat assemblage within the CFA18 area, including the Kenilworth sites.

30 transect surveys (29/4/2012 to 28/9/2012) were undertaken at Crackley Farm (10 surveys, 1/8/2012 to 28/9/2012), Cryfield Grange Farm and Rough Knowles Wood (4 surveys, 24/7/2012 to 12/9/2012) and Brockendon Grange Farm, South Hurst Farm and Crackley Lane Farm (16 surveys, 29/4/2013 to 7/8/2013), Burton Green Farm (adjacent to Little Poors – 12 surveys 07/07/2012 – 26/07/2013). Bats recorded were common pipistrelle, soprano pipistrelle, brown long-eared bat, noctule, Leisler's bat, brown long-eared bat, a *Myotis* species and a *Pipistrellus* species.

26 static detector surveys (19/7/2012 to 6/8/2013) were undertaken at Crackley Farm (7 surveys, 50 deployment nights, 26/7/2012 to 10/6/2013), Brockendon Grange Farm, South Hurst Farm and Crackley Lane Farm (13 surveys, 91 deployment nights, 15/4/2013 to 6/8/2013), Black Waste Wood (6 surveys, 39 deployment nights, 19/7/2012 to 21/5/2013) and Little Poors Wood (5 surveys, 12 deployment nights 02/08/2012 – 30/07/2013). Bats recorded were common pipistrelle, soprano pipistrelle and Nathusius's pipistrelle, brown long-eared bat, noctule, Leisler's bat, serotine, *Nyctalus/Eptesicus* species, a *Myotis* species and a *Pipistrellus* species.

Likely Species Assemblage

Overall this gives an indicative baseline species list of the wider area of potentially 12 species:

1. brown long-eared bat (*Plecotus auritus*),
2. Natterer's bat (*Myotis nattereri*),
3. common pipistrelle (*Pipistrellus pipistrellus*),
4. soprano pipistrelle (*P. pygmaeus*),
5. noctule (*Nyctalus noctula*),
6. Leisler's bat (*N. leisleri*),
7. Brandt's bat (*M. brandtii*),
8. whiskered bat (*M. mystacinus*),
9. serotine (*Eptesicus serotinus*),
10. Nathusius's pipistrelle (*Pipistrellus nathusii*)
11. Daubenton's bat (*M. daubentonii*).
12. Barbastelle bat (*Barbastella barbastellus*) due to records generally within the County of Warwickshire.

Serotine bat is not a tree dwelling species and therefore is not considered to be likely to be affected by tree felling works.

Bats not identified through ALBST at Kenilworth include Nathusius', barbastelle and Daubenton's bat. Daubenton's bat has been found in good numbers at woodlands within 15-20 km including Long Itchington, Marlowes and South Cubbington. Overall this bat is present within the wider area although not identified at the Kenilworth licence area to date. Barbastelle bats have been confirmed to be present at Ash Beds, South Cubbington and Long Itchington but not the Kenilworth sites. The Kenilworth woodland complex is considered highly suitable for these wide-ranging bats. Both species are considered likely to be encountered within the Kenilworth sites area and as such should be included on the licence. Only one Nathusius' bat has been identified within the wider area through ALBST in 2018 and 2019 with only bat sound data from 2012-13 indicating its presence. As such, inclusion of this species on this licence is not considered to be required.

C2 Status of the bat species: Detail conservation status at the local, county and regional levels. Please complete the following table, justifying your assessment, and add additional lines where necessary. If the status is unknown then please enter 'unknown'.

Species	**Conservation status assessment**
	http://heritage.warwickshire.gov.uk/files/2012/05/Bats.pdf/ with reference to the National Bat Monitoring Report 2018 (BCT, 2018). Please see the detailed assessment of the status of bats within Warwickshire within HS2 2012 ES Volume 5 (ref: http://webarchive.nationalarchives.gov.uk/20140806173545/http://assets.dft.gov.uk/hs2-

	environmental-statement/volume-5/ecology/EC-003-003.pdf). This is where the conservation status of *M. mystacinus* and *M. brandtii* is separated and clarified.		
	Local	**County**	**Regional**
Eptesicus serotinus	Local; rare	Local; rare	Local; rare
Myotis brandtii	Local; uncommon	Local; rare	Local; rare
Myotis daubentonii	Widespread; common	Widespread; common	Widespread; common
Myotis nattereri	Widespread; uncommon	Widespread; uncommon	Widespread; uncommon
Myotis mystacinus	Widespread; uncommon	Widespread; uncommon	Widespread; uncommon
Nyctalus leisleri	Local; uncommon	Local; rare; southern	Local; rare
Nyctalus noctula	Widespread; common	Widespread; common	Widespread; common
Pipistrellus nathusii	Unknown	Unknown	Unknown
Pipistrellus pipistrellus	Widespread; common	Widespread; common	Widespread; common
Pipistrellus pygmaeus	Widespread; common	Widespread; common	Widespread; common
Plecotus auritus	Widespread; common	Widespread; common	Widespread; common
Barbastella barbastellus	Local; rare	Local; rare	Local; rare

* ****Please note** that you can add more rows to the table: right click in any cell choose Insert > Insert rows below.*

C3 Objectives of the survey to inform this proposal: Please complete the following table, entering 'Yes', 'No' or N/A' to indicate the objective of your survey and provide comments/explanation where necessary:

Survey objective	Yes / No / N-A	Comments
Determine presence / absence of bats	Yes	The aim of providing a species assemblage for the site
Determine bat usage of site (e.g. maternity, hibernation, night roosts in various structures (specify)).	Yes	Assessment of role of Kenilworth sites as a bat roosting resource and determine status of any tree roosts affected by HS2
Identify foraging, commuting or swarming sites (explain)	N/A	Foraging and commuting routes have been noted where the survey effort allowed, however the focus of the surveys (as detailed above) was to characterise the species assemblage and to identify roosts. Traps were sited in locations where experienced surveyors felt that trapping rates would be higher but a comprehensive assessment of the licence area for the best locations (with the most foraging / commuting) was not undertaken.
Other (explain)	Yes	Roost Identification

C4 Site/habitat description: Please provide:

- Brief descriptions of the site, including total size of the development site (ha) (most often within the red line planning boundary) and areas of the site with potential value to bats (ha).

The four main impacted woodlands comprising the Kenilworth sites are largely comprised of ASNW with various proportions of non-ancient woodland. The area (ha) of the main woodlands and whether they fall within the direct or indirect impact zones of the Scheme is detailed in the table below. The main woodlands and their floristic composition are described in more detail beneath.

Woodland Name	Total woodland area	Area designated as Ancient Woodland	Total Woodland		Ancient Woodland (ASNW)	
			Direct impact area	Indirect Impact Area	Direct impact area	Indirect Impact Area
Birches Wood	0.62	0.62	0.62	0	0.62	0
Black Waste Wood	12.82	11.04	2.05	0.33	2.05	0.33
Broadwells Wood	17.32	15.54	4.30	2.86	3.24	2.38
Rough Knowles Wood	5.07	5.07	0.41	1.01	0.41	1.01

Birches Wood

Lowland mixed deciduous woodland, a habitat of principal importance, with thin-spiked wood sedge (rare in Warwickshire). Birches Wood is not listed as ancient woodland on the Natural England inventory but is shown on historic maps as part of a larger ancient woodland block; this is also indicated by the woodland flora present. This woodland is of District / Borough value.

The woodland canopy of Birches Wood within the Cryfield Grange Farm property is dominated by pedunculate oak, with occasional alder and downy birch. Ash is locally prominent but not generally abundant. Coppiced hazel is the most abundant species in the shrub layer, although there is no sign of recent management. Hawthorn and elder are frequent shrubs, and there is occasional grey willow, holly, blackthorn and field maple. In the ground flora, bramble is abundant and locally dominant, with bluebell also abundant. Yellow archangel is locally abundant. Other species that are prominent include enchanter's nightshade, ground ivy, creeping soft-grass, rough meadow grass, broad buckler-fern, common nettle, cleavers, red campion and wood avens. Wood millet, wood anemone, dog's mercury and thin-spiked wood-sedge are present in low abundance. This woodland community is W10a *Quercus robur-Pteridium aquilinum* woodland typical *Rubus fruticosus* sub-community.

Rough Knowles Wood

Rough Knowles Wood comprises ASNW and supporting lowland mixed deciduous woodland, a habitat of principal importance. The southwestern edge of the woodland is within the land required for the construction of the Proposed Scheme. Given the size of the ancient woodland and its position close to other pockets of ancient and broadleaved woodland, it is considered to be of county/metropolitan value.

Rough Knowles Wood lies to the north of Birches Wood and in the past formed the northernmost block of contiguous woodland which joined Crackley Wood LWS in the south. Rough Knowles Wood is listed as lowland mixed deciduous woodland and has ASNW status. It is surrounded by arable land with a pasture field to the north. The woodland is used at times for grazing pigs; there is electric fencing forming pens in parts of the wood.

The past management and the actions of the pigs that have been grazed in this woodland have resulted in a marked contrast between Rough Knowles Wood and Birches Wood. The canopy is dominated by frequent but scattered pedunculate oak with dense growth of young downy birch and locally frequent young Scots pine. Wild cherry is prominent locally, in stands derived from suckering old trees. Ash and sycamore are present but rare at the site. Young birch, pine and oak form a shrub layer, with hazel occasionally present, and rowan, holly and hawthorn very occasionally found.

The ground flora is distinctive due to the dominance of foxglove in large patches. Bracken is locally dominant where pigs have been excluded. Bluebell is present throughout and bramble, red current, three-nerved sandwort, red campion and wood millet are also frequently encountered.

Broadwells Wood

Broadwells Wood is ancient woodland and an LWS in Warwickshire. It is also lowland mixed deciduous woodland, a Habitat of Principal Importance. The woodland is relatively large (17.32 ha) and comprises mature standards of pedunculate oak, birch and ash, together with some conifers and sycamore, over an understorey of hazel coppice, holly and hawthorn. The lower parts of the site are subject to seasonal waterlogging.

To the south, the woodland is better drained along a shallow, north-east facing slope. Ponds, depressions and flushes are present in the lower parts of the wood. Streams flow through the centre of the wood and around the north-east perimeter. Well-developed wood banks are also present adjacent to the stream on the north-east boundary. Former rides have been neglected and grown over, and in places the understorey is very sparse, and the canopy is relatively open.

The woodland canopy is composed of pedunculate and ash standards. Planted Scots pine, Norway spruce, common larch, sweet chestnut and sycamore are also present. The main woodland is W10a *Quercus robur Pteridium aquilinum-Rubus fruticosus* woodland, typical sub-community, which has bluebell, bracken and bramble dominant in the field layer. Immediately adjacent to the streams, ponds and wetter depressions, the vegetation is influenced by moister and more base-rich conditions with abundant tufted hair-grass and lesser celandine, and occasional patches of wood anemone, opposite-leaved golden-saxifrage, enchanter's nightshade, common marsh-bedstraw and cuckoo flower. This woodland community is W8b *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Anemone nemorosa* sub-community.

Elsewhere in the wood, other sub-communities of these two woodland communities are present in small stands. W10b *Quercus robur-Pteridium aquilinum-Rubus fruticosus* woodland, *Anemone nemorosa* sub-community is present in the south-west of the site, and W10e Qu*ercus robur-Pteridium aquilinum-Rubus fruticosus* woodland, *Acer pseudoplatanus-Oxalis acetosella* sub-community found in the north of the site. Both these sub-communities are locally distributed within Britain and these sub-communities occurring together represent a relatively unique situation. W8e *Fraxinus excelsior-Acer campestre-Mercurialis perenni*s woodland, *Geranium robertianum* sub-community was present in the south of the site, where there is a sycamore and ash canopy and a number of species associated with the wood bank on the southern boundary, including three-nerved sandwort, wood avens and wood speedwell. This herb-Robert sub-community (W8e) is characteristic of the north and west of England and Wales and has a more scattered distribution in the Midlands and further south. Hybrid poplars

have been planted by the stream, where alder is also frequent in the canopy. Two young, small-leaved lime trees are present on the northern boundary, which may have been planted. Other very infrequent tree species included wild apple, situated near the central dividing stream, English elm suckers, wych elm and occasional rowan.

Black Waste Wood

Black Waste Wood LWS is ASNW with a disused railway with a public footpath running north-west to south-east along the southern boundary of the woodland. A small area in the north of woodland has been replanted with conifers. The northern boundary of the woodland is interrupted by amenity gardens and fenced pig enclosures and the southern portion of the woodland has been reduced by clear felling and is partially used by horse riders. A small stream runs through the lower (southern) part of the site, and there are minor wood banks running along parts of the eastern boundary.

Black Waste Wood supports 63 species of vascular plant, 60 of which have a high relative abundance resulting in high diversity. The main body of Black Waste Wood has a canopy of pedunculate oak, silver birch, downy birch and rowan, with an understorey of holly, hawthorn, hazel and honeysuckle. The ground flora is variable dependent on the amount of shading caused by the canopy and shrub layers. In the heavily shaded areas in the south of the site and on the eastern boundary, shade-tolerate woodland species, including some ancient woodland indicators, are present. The most abundant species are bramble, ivy, and bluebell, the latter being very abundant. Yellow archangel is locally prominent, forming patches; and bracken is very abundant under the open birch canopy in the north of the compartment. Also present is wood speedwell, wood anemone, enchanter's nightshade, wood sorrel, wood sedge, scaly male-fern, primrose and broad-leaved helleborine.

Basic statistics for the other minor or inaccessible woodlands included within the licence area are detailed below.

Kenilworth - woodlands within the licence area	**Area of Woodland (ha)**	**Impact Zones**		
		Woodland Directly impacted	**Woodland Indirectly impacted**	**Area not impacted**
Little Poors	1.41	0.15	0.47	0.79
Crackley Wood	21.67	0.97	0.49	20.21
Big Poors	3.26	0.00	0.18	3.08
Other small unnamed portions of woodland	4.02	3.39	0.40	0.23
Total Woodland in licence area (including main woodlands)	**66.19**	**11.89**	**5.74**	**48.55**

- Brief descriptions of the structures on site, differentiating between **those surveyed** and **not surveyed**, with an explanation why. Ensure structures are referenced and consistently indicated on relevant figures and tables.

A total of 170 buildings lie within the Kenilworth licence area (including 98 within the LLAU +20 m), but as they will not be affected by the tree felling for which this licence relates, any impacts on the wider HS2 scheme on those structures will be assessed through traditional survey methods and subsequent appropriate licensing and mitigation.

- A description of adjacent areas/offsite habitats, specifying any relevance to bats, including descriptions of habitat/s relevant to bat commuting/foraging behaviour.

The landscape within the Stoneleigh, Kenilworth and Burton Green (CFA18) section of HS2 is dominated by agricultural land (pasture and arable) with associated hedgerows and trees. The bat interest within the area is increased by a number of habitat features with potential to support roosting, commuting and foraging bats, including watercourses which can provide commuting routes that enable the bats to navigate through the landscape.

- Please also include annotated (cross reference the structures) and dated photographs (showing both internal and external survey areas) as these are very useful as an assessment aid. These can be inserted below or submitted as a separate (referenced) document.

N/A

C5 Field survey(s):

Surveys must be up to date and have been conducted within the current or most recent optimal season. Surveys must be undertaken in accordance with the most up to date edition of the Bat Conservation Trust (BCT) *Bat Surveys for Professional Ecologists – Good Practice Guidelines* and the *Bat Mitigation Guidelines*.

C5a Justification for surveys that deviate from the best practice guidelines: Please provide full justification below if your surveys deviate from the aforementioned best practice guidelines, confirming how you have obtained a full appreciation of the bat species roosting at the site, and of the type and status of roosts they use on site and in the context of the immediate surrounding area. **Please note that inadequate survey information is likely to cause delays to your licence application and may result in a Further Information Request.**

Due to the predicted impacts on woodland habitats as a result of the Scheme, the use of Advanced Licence Bat Survey Techniques (ALBST) was employed to undertake the necessary information-gathering of bats roosting in trees potentially affected by the construction and operation of the Scheme.

Tree-roosting bats are particularly challenging to survey, being small, nocturnal, highly mobile and often do not emit echolocation when emerging, all of which limit the effectiveness of conventional survey methods (e.g. acoustic surveys). Unlike bats that use buildings, tree-roosting bats may only occupy a tree for a period of as little as a few days. As such, the main constraint to surveying bat tree roosts relates to the very low encounter rates due to the resultant frequent movement of bats. As a result, traditional emergence/re-entry surveys are unlikely to effectively determine the presence of bats, and even tree climbing will only encounter evidence of bats using trees approximately 7% of the time (Andrews and Gardner, 2015).

The Bat Conservation Trust (BCT) guidelines (Collins, 2016) recognises these issues and whilst surveys for bats in trees using traditional emergence/re-entry surveys are generally recommended, the guidelines acknowledge these methods as being unlikely to provide confidence in negative results for trees: "*Where there are large numbers of trees, the efficiency and efficacy of PRF inspection and other techniques should be evaluated and alternative methods considered. In situations where there are a lot of trees to survey, such as in woodland, it may be more effective to consider advanced licence bat survey techniques (ALBSTs)*" (Collins, 2016: 6.3.6)

And: "*More detailed information gained from ALBST is likely on projects with greater impacts on 'difficult to survey' bat species such as tree-roosting or quiet-calling species… or in particular habitats such as woodland.*

Non-invasive survey methods are generally unable to confirm the sex, age class or breeding status of individual bats, especially away from the roost. Projects of developments that are likely to have high direct or indirect impacts on bats … will be required to have much more detailed data sets, potentially justifying the use of ALBST. Radio telemetry can provide valuable data on roost use [and] can locate roosts of challenging species (especially in trees)." (Collins, 2016: 9.1)

The guidelines suggest alternative methods such as radio-tracking bats as being more effective at finding roosts in trees, particularly where larger numbers of trees or woodland areas are being affected by projects such as infrastructure schemes.

Therefore, in order to gather the required data in a way that allows the surveyors to locate key, high conservation value roosts (maternity and roosts of Annexe 2 species), establish a species assemblage for the woodland, gain a higher level of confidence in assessment of the number and locations of roosts of lower conservation value, and avoid harm to individual bats during the initial clearance process, the following staged approach has been adopted:

- **Stage 1** comprises a series of bat trapping, tracking and subsequent roost characterisation assessment surveys undertaken in late summer and autumn 2018 and spring and summer 2019. These surveys target bats of specific breeding status to enable surveyors to identify key roosts. Tree inspections (ground level and climbing surveys) were also undertaken to assess the potential for trees to support roosting bats including hibernation roosts.
- **Stage 2** comprises a methodology aimed at avoiding impacts to individual bats during the clearance phase: the undertaking of endoscope surveys of potential roost features (PRFs) which are to be lost to construction, and relocation of any bats found (Rescue Surveys). Bats, if found, will be located to pre-installed bat boxes

on Site or released at dusk, away from works areas at the same site. The numbers and species of bats found during this stage may trigger the provision of additional bat boxes.

Following this approach, a higher number of roosts present within the woodland are likely to be identified, with an overarching mitigation strategy that is rooted in a thorough understanding of the assemblage, number, usage and roost diversity determined by the trapping and tracking surveys (and associated emergence surveys).

This methodology employed is considered to be in line with best practice guidelines and is not considered to be a deviation of those guidelines. Methods were presented to Natural England and HS2 on 24th July 2018. This method relies on a two-step approach to meet requirements for maintaining the Favourable Conservation Status (FCS) of the populations concerned. All trapping, tagging and tracking was undertaken according to the conditions of the licence(s) as issued.

[See Figure C5b – Survey Area]

The woodland as a whole is considered to provide a roosting resource throughout the year including supporting hibernation roosts. This has been assessed and confirmed as part of this licence. Suitable working measures have been incorporated for all roost types.

C5b Please complete the following tables and add additional lines where necessary (*right click in any cell outside the grey box area. Choose Insert > Insert rows below)*. Please enter 'N/A' if the table is not applicable to your survey. Please ensure the information is consistent with Figure **C5b** (showing all buildings, structures and habitats that are within the survey area and distinguishing those that were surveyed and those that were not; indicate where surveyors were located):

Visual inspection – 1. Summary of woodland areas assessed visually relative to total areas and impact zones

Kenilworth - woodlands within the licence area	Area of Woodland (ha)	Visual tree inspections		Impact Zones		
		Area of woodland not assessed	**Area of Woodland Assessed**	**Woodland Directly impacted**	Woodland Indirectly impacted	Area not impacted
Little Poors	1.41	0.79	**0.62**	**0.15**	0.47	0.79
Black Waste	12.82	10.65	**2.17**	**2.05**	0.33	10.44
Broadwells Wood	17.32	10.16	**7.16**	**4.30**	2.86	10.16
Roughknowles	5.07	3.64	**1.43**	**0.41**	1.01	3.65
Birches Wood	0.62	0.00	**0.62**	**0.62**	0.00	0.00
Crackley Wood	21.67	20.92	**0.75**	**0.97**	0.49	20.21
Big Poors	3.26	3.26	**0.00**	**0.00**	0.18	3.08
Other small unnamed portions of woodland	4.02	4.02	**0.00**	**3.39**	0.40	0.23
Total	**66.19**	**53.44**	**12.75**	**11.89**	**5.74**	**48.55**

Visual inspection – 2. Summary of numbers of trees identified with PRF (total licence area)

Kenilworth Sites PRF assessment (visual inspection of trees within the LLAU and 20m buffer)	**Numbers of trees**		
	Direct impact area (LLAU)	**Indirect Impact Area (20 m buffer)**	**Total trees surveyed within licence area**
High potential	107	49	146
Moderate potential	584	141	731
Low potential	~800	~220	~1020

~ Broadwells Wood was surveyed by a third-party contractor who did not record the co-ordinates of low potential trees. Therefore the distribution of the low potential trees has been arbitrarily assigned using a GIS based approach.

All trees were surveyed by two surveyors with binoculars under suitable weather conditions.

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Ground level tree assessments as reported in Table C5b Visual Inspection – 1 (areas) and 2 (tree numbers) above were undertaken in 2018 and 2019 using two surveyors with binoculars on each occasion under suitable weather conditions. More than 2900 trees were assessed with PRF (too many to detail in a table within this method statement) and an assessment of the potential for the trees to support hibernation roosts made. Therefore summary numbers only have been reported above. The location of the high, moderate and low potential trees has been mapped in Figure C6a. All trees with high and moderate potential to support roosting bats were tagged. Full survey details have been provided in an appendix as excel files.

Strips of trees to the north outside of established woodlands but included in the licence area have not been surveyed to undertake a ground level tree assessment (BT1). Initially the survey instruction covered woodland areas only - a subsequent instruction in late 2019 for this area was issued, however access has been refused to several areas, and other areas have not yet been covered by the HS2 land access process. If a ground level tree assessment survey has not been undertaken for trees covered under the licence, trees will be subject to BT1 and BT2 (tree climbing survey) prior to felling as per the procedures outlined within this Method Statement (Section E2.2), with any further requirements for replacement roost features provided also as per the MS. The robust 'umbrella' approach provided within this licence ensures that appropriate data will be captured, impacts to bats will be avoided and reduced as far as possible, and sufficient mitigation and compensation will be implemented. It is considered that the impacts identified in the Method Statement are unlikely to be changed once these areas are assessed as they comprise scattered trees not woodland.

Please provide surveyors names *(including Class Licence registration number if applicable)* and ensure the <u>above</u> table states the number of surveyors used for each survey visit undertaken.

AECOM Survey Leads: [redacted]

Dusk survey

Date of each survey visit (e.g. format 01/06/13)	Start and end times and time of sunset	Structure reference / location	Equipment used (include make of bat detectors and logging equipment)	Weather – *(Include start and end temps, precipitation, Beaufort wind scale etc)*
05/09/2018	Start time: 19:29, end time: 21:44. Sunset 19:44	KS-F001 and KS-F002	Echometer Touch 2	Start: Wind: 2 ; Temp: 17; Rain: 0; Cloud: 3. Finish: Wind: 2 ; Temp: 16; Rain: 0; Cloud: 3.

Comments (to include # of surveyors used for each visit): 2 surveyors.

The surveys for KS-F001 and KS-F002 were undertaken in 2018. Only the positive roost data has been reported (i.e. surveys where roosts were recorded). Surveys which did not identify roosts have not been reported and would add little value or context overall to this assessment, given that the trees have also been surveyed through ALBST as part of the licence area. These traditional surveys are in date and within the relevant area, and therefore have been included on the precautionary and conservative basis that such additional records add context, value and increase the mitigation provision overall for roosts at the site. However they are not strictly required to gain a licence for tree felling.

The robust 'umbrella' approach provided within this licence ensures that appropriate data will be captured prior to tree felling, impacts to bats will be avoided and reduced as far as possible, and sufficient mitigation and compensation will be implemented.

Please provide surveyors names *(including Class Licence registration number if applicable)* and ensure the above table states the number of surveyors used for each survey visit undertaken.

- [redacted] – unlicensed. Experience: >100h and over four years of bat survey experience including emergence / re-entry building surveys, 20 aerial tree surveys, 20 bat activity surveys, preliminary bat roost assessments of trees and buildings; extensive assistant surveyor experience, internal / external inspections of c. 60 buildings.
- [redacted] (assistant) – unlicensed, 2 years experience and approximately 30-50h observing bats on a wide range of survey types.

Dawn survey

Date of each survey visit (e.g. format 01/06/13).	Start and end time and time of sunrise	Structure reference / location	Equipment used (include make of bat detectors and logging equipment)	Weather – *(Include start and end temps, precipitation, Beaufort wind scale etc)*
N/A				
Comments (to include # of surveyors used for each visit):				

Please provide surveyors names *(including Class Licence registration number if applicable)* and ensure the above table states the number of surveyors used for each survey visit undertaken.

N/A

'Other' survey (please specify e.g. trapping, remote, etc)

C5B 'Other' – Bat trapping and tracking surveys (ALBST). The purpose of the surveys is to identify a) the assemblage of bats using the site and b) roosts within the licence area. Other data may also be collected where possible (tagged bat behaviour and location permitting) including flight lines and foraging areas. The survey effort has been split into three tables;

Table A setting out the trapping effort and the details of the bats caught;

Table B summarising the survey effort per bat tagged; and,

Table C detailing the tracking and roost characterisation effort. Results are reported in Section C6.

C5B 'Other' – Table A - Bat trapping surveys. This table sets out the bat trapping effort and the relevant detail of bats trapped and tagged. Trap locations and the dates they were deployed are shown (and detailed in a table) within Figure C6b – Trapping Locations. For the purposes of clarity, bats trapped have been detailed here, as this explains / contextualises the follow-on survey effort reported below.

Date of each survey visit	Start and end times	Location	Bat Details	Weather

04/09/2018 Trapping Survey	17:00 - 02:30	Broadwells Wood	000242 P. auritus adult male; 000326 P. auritus adult n/a female; 1x P. auritus adult n/a female; 1x P. auritus adult nulliparous female; 1x P. auritus adult male; 1x P. pygmaeus adult n/a female.	Wind 1 – 0 Air temp 15 – 12 Rain 0 – 0 Cloud 8 – 8
3x Surveyors; Harp Traps x2 Mist Nets x1 Acoustic Lures x3. 6x bats caught comprising 2x species (P. auritus, P. pygmaeus)				
05/09/2018 Trapping Survey	17:00 - 03:40	Broadwells Wood	000341 P. pipistrellus adult n/a female; 000777 M. nattereri adult male; 1x P. pipistrellus adult male; 1x P. pygmaeus adult male.	Wind 1 – 1 Air temp 15 – 10 Rain 0 – 0 Cloud 3 – 2
3x Surveyors; Harp Traps x3 Acoustic Lures x3. 4x bats caught comprising 3x species (M. nattereri, P. pipistrellus, P. pygmaeus)				
06/09/2018 Trapping Survey	17:30 - 02:00	Big Poors Wood	000816 M. nattereri adult male; 000856 M. nattereri adult male.	Wind 1 – 1 Air temp 8 – 8 Rain 0 – 0 Cloud 2 – 3
3x Surveyors; Harp Traps x2 Mist Nets x1 Acoustic Lures x3. 2x bats caught comprising 1x species (M. nattereri)				
07/09/2018 Trapping Survey	19:30 - 02:00	Big Poors Wood	000364 P. pipistrellus adult n/a female; 000979 P. auritus adult male; 2x P. auritus adult male.	Wind 0 – 0 Air temp 8 – 8 Rain 0 – 0 Cloud 5 – 6
3x Surveyors; Harp Traps x3 Acoustic Lures x3. 4x bats caught comprising 2x species (P. auritus, P. pipistrellus)				
24/09/2018 Trapping Survey	19:00 - 00:00	Birches Wood	000289 P. auritus adult male; 1x P. pygmaeus immature male.	Wind 0 – 0 Air temp 8 – 8 Rain 0 – 0 Cloud 0 – 0
3x Surveyors; Harp Traps x3 Acoustic Lures x3. 2x bats caught comprising 2x species (P. auritus, P. pygmaeus)				
25/09/2018 Trapping Survey	18:58 - 01:40	Little Poors Wood	000337 P. auritus adult male; 000536 P. auritus adult n/a female.	Wind 0 – 0 Air temp 9 – 9 Rain 0 – 0 Cloud 0 – 0
3x Surveyors; Harp Traps x3 Acoustic Lures x3. 2x bats caught comprising 1x species (P. auritus)				
27/09/2018 Trapping Survey	18:50 - 00:51	Rough Knowles Wood	001777 M. nattereri adult n/a female; 000696 M. nattereri adult n/a female.	Wind 2 – 2 Air temp 18 – 15 Rain 0 – 0 Cloud 3 – 5
3x Surveyors; Harp Traps x3 Acoustic Lures x3. 2x bats caught comprising 1x species (M. nattereri)				
28/09/2018 Trapping Survey	18:50 - 00:51	Rough Knowles Wood	001204 M. nattereri immature male.	Wind 0 – 0 Air temp 8 – 8 Rain 0 – 0 Cloud 0 – 0
3x Surveyors; Harp Traps x3 Acoustic Lures x3. 1x bats caught comprising 1x species (M. nattereri)				
13/05/2019 Trapping Survey	20:45 - 01:00	Birches Wood	1x M. mystacinus / brandtii adult nulliparous female; 2x P. pygmaeus adult male.	Wind 1 – 0 Air temp 12 – 8.5 Rain 0 – 0 Cloud 1 – 1
2x Surveyors; Harp Traps x3 Acoustic Lures x3. 3x bats caught comprising 2x species (P. pygmaeus, M. mystacinus / brandtii)				
13/05/2019 Trapping Survey	20:45 - 00:00	Black Waste Wood	237053 P. auritus adult male; 1x M. mystacinus adult nulliparous female; 1x M. mystacinus adult male; 1x P. pipistrellus adult parous female.	Wind 1 – 1 Air temp 13 – 8 Rain 0 – 0 Cloud 2 – 2
4x Surveyors; Harp Traps x3 Acoustic Lures x3. 4x bats caught comprising 3x species (M. mystacinus, P. auritus, P. pipistrellus)				

14/05/2019 Trapping Survey	20:45 - 01:30	Rough Knowles Wood	237054 M. mystacinus adult parous female; 237057 N. noctula adult nulliparous female; 1x M. mystacinus adult parous female; 1x P. auritus adult nulliparous female; 1x P. auritus adult parous female; 1x P. auritus adult male; 2x P. pipistrellus adult male;	Wind 1 – 1 Air temp 16 – 8 Rain 0 – 0 Cloud 2 – 1
3x Surveyors; Harp Traps x3 Acoustic Lures x3. 11x bats caught comprising 5x species (M. mystacinus, N. noctula, P. auritus, P. pipistrellus, P. pygmaeus)				
14/05/2019 Trapping Survey	20:40 - 01:10	Broadwells Wood	237060 P. auritus adult pregnant female; 237061 M. nattereri adult male; 1x M. mystacinus adult male; 3x M. mystacinus / brandtii adult pregnant female; 1x P. pipistrellus adult male; 1x P. pygmaeus adult male.	Wind 0 – 0 Air temp 15 – 9 Rain 0 – 0 Cloud 1 – 1
3x Surveyors; Harp Traps x3 Acoustic Lures x3. 8x bats caught comprising 5-6x species (M. mystacinus, M. nattereri, P. auritus, P. pipistrellus, P. pygmaeus, M. mystacinus / brandtii)				
20/05/2019 Trapping Survey	21:03 - 02:04	Rough Knowles Wood	1x P. pipistrellus adult parous female; 1x P. pipistrellus adult male; 1x P. pipistrellus juvenile male.	Wind 1 – 2 Air temp 14.4 – 10 Rain 0 – 0 Cloud 1 – 2
4x Surveyors; Harp Traps x2 Mist Nets x1 . 3x bats caught comprising 1x species (P. pipistrellus)				
21/05/2019 Trapping Survey	21:00 - 23:56	Black Waste Wood	1x M. mystacinus adult parous female; 1x P. auritus adult nulliparous female; 1x P. auritus adult parous female.	Wind 1 – 2 Air temp 13 – 8 Rain 0 – 0 Cloud 0 – 0
4x Surveyors; Harp Traps x2 Mist Nets x1 . 3x bats caught comprising 2x species (M. mystacinus, P. auritus)				
26/05/2019 Trapping Survey	20:30 - 02:28	Broadwells Wood	237055 P. auritus adult male; 237062 P. auritus adult pregnant female; 238317 N. leisleri adult male; 1x M. brandtii adult male; 1x M. mystacinus / brandtii adult nulliparous female; 1x M. mystacinus / brandtii adult male; 1x P. auritus adult pregnant fem	Wind 0 – 0 Air temp 11 – 10 Rain 0 – 0 Cloud 1 – 1
3x Surveyors; Harp Traps x3 Acoustic Lures x3. 11x bats caught comprising 4-5x species (M. brandtii, N. leisleri, P. auritus, P. pygmaeus, M. mystacinus / brandtii)				
26/05/2019 Trapping Survey	20:56 - 01:22	Broadwells Wood	238314 M. nattereri juvenile male; 1x P. pipistrellus adult parous female; 1x P. pipistrellus adult pregnant female; 1x P. pipistrellus adult male.	Wind 0 – 0 Air temp 14 – 10 Rain 0 – 0 Cloud 2 – 0
4x Surveyors; Harp Traps x2 Mist Nets x1 Acoustic Lures x2. 4x bats caught comprising 2x species (M. nattereri, P. pipistrellus)				
02/06/2019 Trapping Survey	21:19 - 00:45	Black Waste Wood	238333 M. nattereri adult male; 238349 N. leisleri adult male; 1x M. brandtii juvenile male; 1x M. mystacinus adult male; 1x P. auritus adult parous female; 1x P. pipistrellus adult pregnant female; 2x P. pipistrellus adult male.	Wind 2 – 1 Air temp 13.5 – 12 Rain 0 – 0 Cloud 3 – 3
4x Surveyors; Harp Traps x3 Acoustic Lures x3. 8x bats caught comprising 6x species (M. brandtii, M. mystacinus, M. nattereri, N. leisleri, P. auritus, P. pipistrellus)				

03/06/2019 Trapping Survey	21:19 - 00:00	Broadwells Wood	238335 M. brandtii adult parous female; 238350 P. auritus adult parous female; 3x M. mystacinus adult parous female; 1x M. mystacinus adult male; 3x P. auritus adult parous female; 1x P. auritus adult pregnant female; 2x P. pipistrellus adult male; 2x P.	Wind 1 – 2 Air temp 14 – 9 Rain 0 – 0 Cloud 3 – 4
4x Surveyors; Harp Traps x3 Acoustic Lures x3. 14x bats caught comprising 5x species (M. brandtii, M. mystacinus, P. auritus, P. pipistrellus, P. pygmaeus)				
04/06/2019 Trapping Survey	21:20 - 02:00	Rough Knowles Wood	238336 P. auritus adult pregnant female; 238351 N. noctula adult male; 1x M. nattereri adult pregnant female; 1x P. pipistrellus adult parous female; 1x P. pipistrellus adult male; 1x P. pygmaeus juvenile male.	Wind 2 – 4 Air temp 13 – 10 Rain 0 – 0 Cloud 2 – 6
4x Surveyors; Harp Traps x3 Acoustic Lures x3. 6x bats caught comprising 5x species (M. nattereri, N. noctula, P. auritus, P. pipistrellus, P. pygmaeus)				
05/06/2019 Trapping Survey	21:21 - 02:30	Birches Wood	238352 N. noctula juvenile male; 238353 P. auritus adult pregnant female; 1x P. pipistrellus adult nulliparous female; 1x P. pipistrellus adult male; 1x P. pygmaeus adult pregnant female.	Wind 2 – 1 Air temp 14 – 8 Rain 0 – 0 Cloud 2 – 1
4x Surveyors; Harp Traps x2 Acoustic Lures x2. 5x bats caught comprising 4x species (N. noctula, P. auritus, P. pipistrellus, P. pygmaeus)				
09/06/2019 Trapping Survey	20:15 - 02:26	Broadwells Wood	238369 P. auritus adult pregnant female; 238370 N. noctula adult male; 1x M. brandtii adult male; 1x M. mystacinus juvenile male; 1x M. mystacinus / brandtii adult pregnant female; 1x P. auritus adult pregnant female.	Wind 1 – 1 Air temp 15 – 8.5 Rain 0 – 0 Cloud 6 – 4
4x Surveyors; Harp Traps x3 Acoustic Lures x3. 6x bats caught comprising 4x species (M. brandtii, M. mystacinus, N. noctula, P. auritus)				
18/06/2019 Trapping Survey	21:31 - 01:31	Black Waste Wood	239032 P. pygmaeus juvenile male; 1x P. auritus juvenile male; 1x P. pipistrellus adult male; 1x P. pipistrellus juvenile male.	Wind 2 – 1 Air temp 14 – 10 Rain 2 – 2 Cloud 7 – 7
4x Surveyors; Harp Traps x3 Acoustic Lures x3. 4x bats caught comprising 3x species (P. auritus, P. pipistrellus, P. pygmaeus)				
24/06/2019 Trapping Survey	20:00 - 03:25	Broadwells Wood	239033 M. mystacinus adult lactating female; 239037 M. nattereri adult male; 239055 P. auritus adult pregnant female; 1x M. mystacinus adult male; 2x P. auritus adult pregnant female.	Wind 0 – 0 Air temp 21 – 16 Rain 0 – 1 Cloud 8 – 8
4x Surveyors; Harp Traps x2 Mist Nets x1 Acoustic Lures x3. 6x bats caught comprising 3x species (M. mystacinus, M. nattereri, P. auritus)				
26/06/2019 Trapping Survey	21:25 - 02:15	Rough Knowles Wood	No bats caught.	Wind 2 – 4 Air temp 16 – 11 Rain 0 – 0 Cloud 7 – 8
5x Surveyors; Harp Traps x2 Mist Nets x1 Acoustic Lures x2				
01/07/2019 Trapping Survey	20:20 - 02:22	Rough Knowles Wood	239433 P. auritus adult male.	Wind 5 – 2 Air temp 16 – 15 Rain 0 – 0 Cloud 1 – 1
4x Surveyors; Harp Traps x3 Acoustic Lures x3. 1x bats caught comprising 1x species (P. auritus)				

01/07/2019 Trapping Survey	20:52 - 02:45	Broadwells Wood	239041 M. mystacinus juvenile parous female; 239042 M. brandtii adult parous female; 1x M. mystacinus juvenile male; 1x M. nattereri adult male; 1x P. pipistrellus adult pregnant female; 1x P. pipistrellus adult male; 1x P. pipistrellus juvenile male.	Wind 2 – 1 Air temp 17 – 9 Rain 0 – 0 Cloud 2 – 0
4x Surveyors; Harp Traps x3 Acoustic Lures x3. 7x bats caught comprising 4x species (M. brandtii, M. mystacinus, M. nattereri, P. pipistrellus)				
02/07/2019 Trapping Survey	20:51 - 02:00	Broadwells Wood	239039 P. auritus adult lactating female; 239050 M. mystacinus adult parous female; 1x P. pipistrellus adult parous female; 1x P. pipistrellus adult male; 1x P. pygmaeus adult lactating female; 1x P. pygmaeus adult male.	Wind 2 – 1 Air temp 15 – 9 Rain 0 – 0 Cloud 1 – 0
4x Surveyors; Harp Traps x3 Acoustic Lures x3. 6x bats caught comprising 4x species (M. mystacinus, P. auritus, P. pipistrellus, P. pygmaeus)				
03/07/2019 Trapping Survey	21:31 - 01:15	Broadwells Wood	239043 N. noctula juvenile male; 239058 P. auritus adult lactating female; 2x M. mystacinus adult parous female; 1x M. mystacinus adult male; 1x P. auritus adult lactating female; 1x P. auritus adult male.	Wind 1 – 1 Air temp 17 – 10 Rain 0 – 0 Cloud 1 – 1
4x Surveyors; Harp Traps x3 Acoustic Lures x3. 7x bats caught comprising 3x species (M. mystacinus, N. noctula, P. auritus)				
08/07/2019 Trapping Survey	20:15 - 02:04	Birches Wood	No bats caught.	Wind 0 – 1 Air temp 20 – 16 Rain 0 – 0 Cloud 3 – 4
4x Surveyors; Harp Traps x2 Mist Nets x1 Acoustic Lures x3				
16/07/2019 Trapping Survey	20:50 - 03:00	Black Waste Wood	239871 P. auritus adult parous female; 1x N. noctula adult male; 2x P. auritus juvenile male.	Wind 1 – 1 Air temp 16.9 – 14 Rain 0 – 0 Cloud 2 – 7
4x Surveyors; Harp Traps x3 Acoustic Lures x3. 4x bats caught comprising 2x species (N. noctula, P. auritus)				
17/07/2019 Trapping Survey	20:30 - 02:30	Black Waste Wood	239430 P. auritus adult lactating female; 1x P. pygmaeus juvenile male.	Wind 1 – 1 Air temp 17 – 15 Rain 0 – 0 Cloud 0 – 0
4x Surveyors; Harp Traps x2 Acoustic Lures x2. 2x bats caught comprising 2x species (P. auritus, P. pygmaeus)				
26/07/2019 Trapping Survey	20:30 - 01:40	Rough Knowles Wood	239439 M. nattereri juvenile nulliparous female; 239844 P. pygmaeus juvenile male.	Wind 2 – 2 Air temp 18 – 16 Rain 2 – 3 Cloud 6 – 8
2x Surveyors; Harp Traps x3 Acoustic Lures x3. 2x bats caught comprising 2x species (M. nattereri, P. pygmaeus)				
08/08/2019 Trapping Survey	19:51 - 00:02	Birches Wood	240266 P. auritus adult parous female.	Wind 0 – 0 Air temp 21 – 16 Rain 0 – 4 Cloud 1 – 8
4x Surveyors; Harp Traps x3 Acoustic Lures x3. 1x bats caught comprising 1x species (P. auritus)				

14/08/2019 Trapping Survey	19:35 - 01:57	Rough Knowles Wood	239451 M. nattereri juvenile nulliparous female; 239456 M. nattereri juvenile male; 239460 N. leisleri juvenile male; 1x M. nattereri juvenile male; 1x P. pipistrellus adult nulliparous female; 1x P. pipistrellus adult parous female; 1x P. pipistrellus ad	Wind 2 – 1 Air temp 16 – 13 Rain 0 – 0 Cloud 7 – 6
4x Surveyors; Harp Traps x2 Mist Nets x1 Acoustic Lures x3. 9x bats caught comprising 4x species (M. nattereri, N. leisleri, P. pipistrellus, P. pygmaeus)				
22/08/2019 Trapping Survey	19:15 - 01:50	Broadwells Wood	240261 M. mystacinus adult male; 240284 P. pipistrellus juvenile nulliparous female; 240285 M. brandtii adult male; 240286 P. auritus adult male; 1x M. mystacinus adult nulliparous female; 3x M. mystacinus juvenile nulliparous female; 1x M. mystacinus juv	Wind 2 – 1 Air temp 17 – 14 Rain 0 – 0 Cloud 4 – 2
3x Surveyors; Harp Traps x3 Acoustic Lures x3. 15x bats caught comprising 5x species (M. brandtii, M. mystacinus, P. auritus, P. pipistrellus, P. pygmaeus)				
23/08/2019 Trapping Survey	19:20 - 01:33	Black Waste Wood	239442 N. noctula adult parous female; 240272 M. mystacinus juvenile nulliparous female; 1x P. pygmaeus adult male.	Wind 1 – 0 Air temp 22 – 16 Rain 0 – 0 Cloud 2 – 2
3x Surveyors; Harp Traps x2 Mist Nets x1 Acoustic Lures x3. 3x bats caught comprising 3x species (M. mystacinus, N. noctula, P. pygmaeus)				
08/09/2019 Trapping Survey	18:30 - 01:41	Birches Wood	240289 M. mystacinus adult male; 240319 N. leisleri juvenile male.	Wind 1 – 1 Air temp 17 – 14 Rain 0 – 0 Cloud 4 – 3
4x Surveyors; Harp Traps x3 Acoustic Lures x3. 2x bats caught comprising 2x species (M. mystacinus, N. leisleri)				

C5B 'Other' – Table B - summary of survey effort per bat tagged.

Date Tagged	Tag	Species	Daytime Tracking	Roost Characterisation / Night Tracking	Woodland where tagged
04/09/2018	000242	*P. auritus*	5	4	Broadwells Wood
04/09/2018	000326	*P. auritus*	8	6	Broadwells Wood
05/09/2018	000341	*P. pipistrellus*	7	3	Broadwells Wood
05/09/2018	000777	*M. nattereri*	7	6	Broadwells Wood
06/09/2018	000816	*M. nattereri*	6	2	Big Poors Wood
06/09/2018	000856	*M. nattereri*	5	2	Big Poors Wood
07/09/2018	000364	*P. pipistrellus*	4		Big Poors Wood
07/09/2018	000979	*P. auritus*	5	2	Big Poors Wood
24/09/2018	000289	*P. auritus*	3	2	Birches Wood
25/09/2018	000337	*P. auritus*	1		Little Poors Wood
25/09/2018	000536	*P. auritus*	1		Little Poors Wood
27/09/2018	000696	*M. nattereri*	2	5	Rough Knowles Wood
27/09/2018	001777	*M. nattereri*	4	6	Rough Knowles Wood
28/09/2018	001204	*M. nattereri*	3	5	Rough Knowles Wood
13/05/2019	237053	*P. auritus*	2	2	Black Waste Wood
14/05/2019	237054	*M. mystacinus*	2		Rough Knowles Wood

14/05/2019	237057	*N. noctula*	2		Rough Knowles Wood
14/05/2019	237060	*P. auritus*	3		Broadwells Wood
14/05/2019	237061	*M. nattereri*	3	4	Broadwells Wood
26/05/2019	237055	*P. auritus*	4	2	Broadwells Wood
26/05/2019	237062	*P. auritus*	3	1	Broadwells Wood
26/05/2019	238314	*M. nattereri*	4	4	Broadwells Wood
26/05/2019	238317	*N. leisleri*	5	1	Broadwells Wood
02/06/2019	238333	*M. nattereri*	7	1	Black Waste Wood
02/06/2019	238349	*N. leisleri*	6	2	Black Waste Wood
03/06/2019	238335	*M. brandtii*	7	2	Broadwells Wood
03/06/2019	238350	*P. auritus*	7	3	Broadwells Wood
04/06/2019	238336	*P. auritus*	6	2	Rough Knowles Wood
04/06/2019	238351	*N. noctula*	3		Rough Knowles Wood
05/06/2019	238352	*N. noctula*	2		Birches Wood
05/06/2019	238353	*P. auritus*	2	2	Birches Wood
09/06/2019	238369	*P. auritus*	4	3	Broadwells Wood
09/06/2019	238370	*N. noctula*			Broadwells Wood
18/06/2019	239032	*P. pygmaeus*	4	2	Black Waste Wood
24/06/2019	239033	*M. mystacinus*	4	2	Broadwells Wood
24/06/2019	239037	*M. nattereri*	5	1	Broadwells Wood
24/06/2019	239055	*P. auritus*	3	3	Broadwells Wood
01/07/2019	239041	*M. mystacinus*	6	1	Broadwells Wood
01/07/2019	239042	*M. brandtii*	6		Broadwells Wood
01/07/2019	239433	*P. auritus*	5	3	Rough Knowles Wood
02/07/2019	239039	*P. auritus*	6	1	Broadwells Wood
02/07/2019	239050	*M. mystacinus*	6		Broadwells Wood
03/07/2019	239043	*N. noctula*	4		Broadwells Wood
03/07/2019	239058	*P. auritus*	4	1	Broadwells Wood
16/07/2019	239871	*P. auritus*	4	2	Black Waste Wood
17/07/2019	239430	*P. auritus*	7	2	Black Waste Wood
26/07/2019	239439	*M. nattereri*	7	4	Rough Knowles Wood
26/07/2019	239844	*P. pygmaeus*	6	1	Rough Knowles Wood
08/08/2019	240266	*P. auritus*	2	2	Birches Wood
14/08/2019	239451	*M. nattereri*	2	1	Rough Knowles Wood
14/08/2019	239456	*M. nattereri*	2	1	Rough Knowles Wood
14/08/2019	239460	*N. leisleri*	4		Rough Knowles Wood
22/08/2019	240261	*M. mystacinus*	5	3	Broadwells Wood
22/08/2019	240284	*P. pipistrellus*	5	3	Broadwells Wood
22/08/2019	240285	*M. brandtii*	5	4	Broadwells Wood
22/08/2019	240286	*P. auritus*	5	4	Broadwells Wood
23/08/2019	239442	*N. noctula*	3	2	Black Waste Wood
23/08/2019	240272	*M. mystacinus*	4	1	Black Waste Wood
08/09/2019	240289	*M. mystacinus*	2	1	Birches Wood

08/09/2019	240319	*N. leisleri*	2	1	Birches Wood

C5B 'Other' – Table C - tracking and roost characterisation survey effort. This table sets out the survey effort (which bat was tracked, where and when). Results are presented in C6 below this table.

Date of each survey visit	Start and end times	Location	Bat Details	Weather
05/09/2018 Daytime Tracking Survey	12:30 – 15:30	Broadwells Wood	000242 P. auritus; 000326 P. auritus.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
05/09/2018 Emergence / Tracking Survey	19:30 – 21:30	Broadwells Wood	000242 P. auritus; 000326 P. auritus.	Wind 1 – 1 Air temp 17 – 17 Rain 0 – 0 Cloud 3 – 3
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
05/09/2018 Emergence / Tracking Survey	20:25 – 23:00	Broadwells Wood	000242 P. auritus; 000326 P. auritus.	Wind 1 – 2 Air temp 17 – 13 Rain 0 – 0 Cloud 3 – 2
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
06/09/2018 Daytime Tracking Survey	09:30 – 20:00	Broadwells Wood	000242 P. auritus; 000326 P. auritus; 000341 P. pipistrellus; 000777 M. nattereri; 000777 M. nattereri.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
06/09/2018 Emergence / Tracking Survey	19:30 – 21:10	Broadwells Wood	000777 M. nattereri.	Wind 1 – 1 Air temp 13 – 13 Rain 0 – 0 Cloud 0 – 0
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
06/09/2018 Emergence / Tracking Survey	19:40 – 22:40	Broadwells Wood	000341 P. pipistrellus; 000242 P. auritus; 000326 P. auritus; 000777 M. nattereri.	Wind 1 – 2 Air temp 14 – 11 Rain 0 – 0 Cloud 0 – 0
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
07/09/2018 Daytime Tracking Survey	09:00 – 10:30	Broadwells Wood	000242 P. auritus; 000326 P. auritus; 000341 P. pipistrellus; 000777 M. nattereri.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
07/09/2018 Emergence / Tracking Survey	18:33 – 22:45	Broadwells Wood	000242 P. auritus; 000326 P. auritus; 000341 P. pipistrellus; 000777 M. nattereri.	Wind 1 – 1 Air temp 13 – 10 Rain 0 – 0 Cloud 1 – 1
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
07/09/2018 Emergence / Tracking Survey	19:30 – 21:10	Broadwells Wood	000777 M. nattereri.	Wind 1 – 1 Air temp 14 – 14 Rain 0 – 0 Cloud 1 – 1
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
08/09/2018 Daytime Tracking Survey	13:15 – 19:00	Broadwells Wood	000326 P. auritus; 000777 M. nattereri.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				

08/09/2018 Emergence / Tracking Survey	19:20 – 20:30	Broadwells Wood	000777 M. nattereri.	Wind 1 – 1 Air temp 20 – 20 Rain 0 – 0 Cloud 5 – 5
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
09/09/2018 Daytime Tracking Survey	14:24 – 17:45	Big Poors Wood	000364 P. pipistrellus; 000979 P. auritus.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
09/09/2018 Daytime Tracking Survey	14:24 – 17:45	Broadwells Wood	000326 P. auritus; 000341 P. pipistrellus; 000777 M. nattereri.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
09/09/2018 Emergence / Tracking Survey	19:20 – 21:45	Broadwells Wood	000326 P. auritus; 000777 M. nattereri.	Wind 1 – 1 Air temp 20 – 17 Rain 0 – 0 Cloud 1 – 1
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
09/09/2018 Emergence / Tracking Survey	19:30 – 22:00	Big Poors Wood	000979 P. auritus.	Wind 3 – 2 Air temp 18 – 15 Rain 0 – 0 Cloud 7 – 6
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
10/09/2018 Daytime Tracking Survey	12:30 – 16:15	Big Poors Wood	000816 M. nattereri; 000856 M. nattereri; 000979 P. auritus.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
10/09/2018 Daytime Tracking Survey	12:30 – 16:15	Broadwells Wood	000326 P. auritus; 000341 P. pipistrellus.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
10/09/2018 Emergence / Tracking Survey	19:00 – 22:30	Big Poors Wood	000979 P. auritus; 000856 M. nattereri; 000816 M. nattereri.	Wind 4 – 4 Air temp 17 – 15 Rain 0 – 0 Cloud 8 – 8
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
10/09/2018 Emergence / Tracking Survey	19:00 – 22:30	Broadwells Wood	000326 P. auritus; 000341 P. pipistrellus.	Wind 4 – 4 Air temp 17 – 15 Rain 0 – 0 Cloud 8 – 8
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
11/09/2018 Daytime Tracking Survey	14:30 – 16:00	Big Poors Wood	000816 M. nattereri; 000856 M. nattereri; 000979 P. auritus.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
11/09/2018 Daytime Tracking Survey	14:30 – 16:00	Broadwells Wood	000242 P. auritus; 000326 P. auritus; 000341 P. pipistrellus; 000777 M. nattereri.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
12/09/2018 Daytime Tracking Survey	15:00 – 21:32	Broadwells Wood	000242 P. auritus; 000326 P. auritus; 000341 P. pipistrellus; 000777 M. nattereri.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
12/09/2018 Daytime Tracking Survey	15:00 – 21:32	Big Poors Wood	000856 M. nattereri.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
12/09/2018 Emergence / Tracking Survey	19:00 – 20:30	Big Poors Wood	000816 M. nattereri.	Wind 1 – 1 Air temp 13 – 13 Rain 0 – 0

				Cloud 2 – 2
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
13/09/2018 Daytime Tracking Survey	13:15 – 17:00	Big Poors Wood	000816 M. nattereri; 000856 M. nattereri; 000979 P. auritus.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
13/09/2018 Daytime Tracking Survey	13:15 – 17:00	Broadwells Wood	000341 P. pipistrellus; 000777 M. nattereri.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
14/09/2018 Daytime Tracking Survey	09:30 – 11:00	Big Poors Wood	000816 M. nattereri; 000979 P. auritus.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
14/09/2018 Emergence / Tracking Survey	19:15 – 20:20	Big Poors Wood	000856 M. nattereri.	Wind 1 – 1 Air temp 15 – 15 Rain 0 – 0 Cloud 8 – 8
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
25/09/2018 Daytime Tracking Survey	15:30 – 16:04	Birches Wood	000289 P. auritus.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
25/09/2018 Emergence / Tracking Survey	18:55 – 22:10	Birches Wood	000289 P. auritus.	Wind 1 – 1 Air temp 12 – 11 Rain 0 – 0 Cloud 2 – 0
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
25/09/2018 Emergence / Tracking Survey	19:00 – 21:20	Birches Wood	000289 P. auritus.	Wind 0 – 0 Air temp 12 – 12 Rain 0 – 0 Cloud 2 – 2
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
26/09/2018 Daytime Tracking Survey	10:00 – 11:30	Birches Wood	000289 P. auritus.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
26/09/2018 Daytime Tracking Survey	15:00 – 16:00	Little Poors Wood		N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
27/09/2018 Daytime Tracking Survey	15:00 – 17:00	Birches Wood	000289 P. auritus.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
28/09/2018 Daytime Tracking Survey	13:00 – 14:00	Rough Knowles Wood	000696 M. nattereri; 001777 M. nattereri.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
28/09/2018 Emergence / Tracking Survey	18:40 – 21:15	Rough Knowles Wood	000696 M. nattereri; 001777 M. nattereri.	Wind 1 – 1 Air temp 14 – 14 Rain 0 – 0 Cloud 2 – 2
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
01/10/2018 Daytime Tracking Survey	12:00 – 16:00	Rough Knowles Wood	000696 M. nattereri; 001204 M. nattereri; 001777 M. nattereri.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
01/10/2018 Emergence / Tracking Survey	18:00 – 21:00	Rough Knowles Wood	001204 M. nattereri.	Wind 1 – 0 Air temp 11 – 11 Rain 0 – 0 Cloud 3 – 0
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				

01/10/2018 Emergence / Tracking Survey	18:30 – 20:15	Rough Knowles Wood	001777 M. nattereri.	Wind 2 – 2 Air temp 13 – 13 Rain 0 – 0 Cloud 7 – 7
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
01/10/2018 Emergence / Tracking Survey	18:40 – 20:45	Rough Knowles Wood	001204 M. nattereri.	Wind 1 – 1 Air temp 14 – 14 Rain 0 – 0 Cloud 3 – 3
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
02/10/2018 Daytime Tracking Survey	14:30 – 15:15	Rough Knowles Wood	001204 M. nattereri; 001777 M. nattereri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
02/10/2018 Emergence / Tracking Survey	18:27 – 20:58	Rough Knowles Wood	000696 M. nattereri.	Wind 2 – 2 Air temp 15 – 15 Rain 1 – 1 Cloud 7 – 7
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
02/10/2018 Emergence / Tracking Survey	18:30 – 20:30	Rough Knowles Wood	001204 M. nattereri.	Wind 3 – 3 Air temp 14 – 14 Rain 1 – 1 Cloud 7 – 7
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
02/10/2018 Emergence / Tracking Survey	18:30 – 20:30	Rough Knowles Wood	001777 M. nattereri.	Wind 3 – 3 Air temp 14 – 14 Rain 1 – 1 Cloud 7 – 7
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
02/10/2018 Emergence / Tracking Survey	18:30 – 20:54	Rough Knowles Wood	001777 M. nattereri; 001204 M. nattereri; 000696 M. nattereri.	Wind 3 – 3 Air temp 14 – 14 Rain 1 – 1 Cloud 7 – 0
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
03/10/2018 Daytime Tracking Survey	15:30 – 14:15	Rough Knowles Wood	001204 M. nattereri; 001777 M. nattereri.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
03/10/2018 Emergence / Tracking Survey	18:30 – 20:30	Rough Knowles Wood	001777 M. nattereri; 000696 M. nattereri; 001204 M. nattereri.	Wind 1 – 1 Air temp 14 – 14 Rain 0 – 0 Cloud 6 – 6
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
05/10/2018 Emergence / Tracking Survey	18:40 – 21:15	Rough Knowles Wood	000696 M. nattereri; 001777 M. nattereri.	Wind 0 – 0 Air temp 14 – 11 Rain 0 – 0 Cloud 0 – 0
3x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
14/05/2019 Daytime Tracking Survey	15:00 – 18:30	Black Waste Wood	237053 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
14/05/2019 Emergence / Tracking Survey	20:00 – 00:00	Black Waste Wood	237053 P. auritus.	Wind 1 – 1 Air temp 15 – 10 Rain 0 – 0 Cloud 2 – 1
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				

15/05/2019 Daytime Tracking Survey	16:00 – 17:30	Black Waste Wood	237053 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
15/05/2019 Daytime Tracking Survey	16:00 – 18:30	Broadwells Wood	237060 P. auritus; 237061 M. nattereri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
15/05/2019 Emergence / Tracking Survey	20:20 – 23:30	Black Waste Wood	237053 P. auritus.	Wind 0 – 0 Air temp 14 – 12 Rain 0 – 0 Cloud 1 – 1
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
15/05/2019 Emergence / Tracking Survey	20:30 – 23:30	Broadwells Wood	237061 M. nattereri.	Wind 1 – 1 Air temp 19 – 17 Rain 0 – 0 Cloud 0 – 1
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
16/05/2019 Daytime Tracking Survey	15:30 – 18:30	Rough Knowles Wood	237054 M. mystacinus; 237057 N. noctula.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
16/05/2019 Daytime Tracking Survey	17:20 – 20:30	Broadwells Wood	237060 P. auritus; 237061 M. nattereri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
17/05/2019 Daytime Tracking Survey	13:00 – 15:30	Rough Knowles Wood	237054 M. mystacinus; 237057 N. noctula.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
17/05/2019 Daytime Tracking Survey	14:30 – 18:30	Broadwells Wood	237060 P. auritus; 237061 M. nattereri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
27/05/2019 Daytime Tracking Survey	14:00 – 17:50	Broadwells Wood	237055 P. auritus; 237062 P. auritus; 238314 M. nattereri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
27/05/2019 Daytime Tracking Survey	15:00 – 17:30	Broadwells Wood	238317 N. leisleri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
27/05/2019 Emergence / Tracking Survey	20:45 – 23:30	Broadwells Wood	238314 M. nattereri.	Wind 0 – 1 Air temp 16 – 14 Rain 0 – 1 Cloud 6 – 7
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
28/05/2019 Daytime Tracking Survey	15:00 – 18:30	Broadwells Wood	238314 M. nattereri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
28/05/2019 Daytime Tracking Survey	15:00 – 20:00	Broadwells Wood	237055 P. auritus; 237062 P. auritus; 238317 N. leisleri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
28/05/2019 Emergence / Tracking Survey	20:30 – 00:15	Broadwells Wood	238314 M. nattereri.	Wind 1 – 2 Air temp 13 – 9 Rain 0 – 0 Cloud 2 – 2
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
28/05/2019 Emergence / Tracking Survey	20:54 – 23:05	Broadwells Wood	237055 P. auritus; 237062 P. auritus.	Wind 1 – 1 Air temp 12 – 11 Rain 0 – 0 Cloud 1 – 1
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
29/05/2019 Daytime Tracking Survey	15:00 – 19:00	Broadwells Wood	237062 P. auritus; 238314 M. nattereri;	N/A

			238317 N. leisleri.	
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
29/05/2019 Daytime Tracking Survey	15:00 – 19:55	Broadwells Wood	237055 P. auritus; 238317 N. leisleri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
29/05/2019 Emergence / Tracking Survey	20:30 – 00:30	Broadwells Wood	238314 M. nattereri; 238317 N. leisleri.	Wind 1 – 1 Air temp 15 – 13 Rain 0 – 0 Cloud 7 – 7
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
29/05/2019 Emergence / Tracking Survey	20:50 – 23:42	Broadwells Wood	237055 P. auritus.	Wind 0 – 1 Air temp 15 – 14 Rain 0 – 0 Cloud 8 – 6
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
03/06/2019 Daytime Tracking Survey	15:00 – 19:30	Black Waste Wood	238333 M. nattereri; 238349 N. leisleri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
03/06/2019 Daytime Tracking Survey	15:00 – 19:30	Broadwells Wood	237055 P. auritus; 238314 M. nattereri; 238317 N. leisleri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
03/06/2019 Emergence / Tracking Survey	21:00 – 00:00	Black Waste Wood	238349 N. leisleri.	Wind 1 – 1 Air temp 16 – 15 Rain 0 – 0 Cloud 2 – 2
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
05/06/2019 Daytime Tracking Survey	13:00 – 15:30	Broadwells Wood	238335 M. brandtii; 238350 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
05/06/2019 Daytime Tracking Survey	14:00 – 19:00	Rough Knowles Wood	238336 P. auritus; 238351 N. noctula.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
05/06/2019 Daytime Tracking Survey	14:30 – 19:15	Black Waste Wood	238333 M. nattereri; 238349 N. leisleri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
05/06/2019 Emergence / Tracking Survey	20:45 – 23:45	Broadwells Wood	238335 M. brandtii; 238350 P. auritus.	Wind 1 – 1 Air temp 14 – 12 Rain 0 – 0 Cloud 1 – 1
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
06/06/2019 Daytime Tracking Survey	13:30 – 16:45	Birches Wood	238352 N. noctula; 238353 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
06/06/2019 Daytime Tracking Survey	14:30 – 19:00	Broadwells Wood	238335 M. brandtii; 238350 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
06/06/2019 Emergence / Tracking Survey	21:05 – 23:45	Birches Wood	238353 P. auritus.	Wind 1 – 0 Air temp 13 – 11 Rain 0 – 0 Cloud 1 – 0
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
06/06/2019 Emergence / Tracking Survey	22:35 – 23:44	Black Waste Wood	238349 N. leisleri.	Wind 1 – 1 Air temp 16 – 14 Rain 0 – 0 Cloud 1 – 1
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				

07/06/2019 Daytime Tracking Survey	15:00 – 20:30	Rough Knowles Wood	238336 P. auritus; 238351 N. noctula.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
07/06/2019 Daytime Tracking Survey	15:00 – 20:30	Broadwells Wood	238335 M. brandtii; 238350 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
07/06/2019 Daytime Tracking Survey	15:00 – 20:30	Birches Wood	238352 N. noctula; 238353 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
07/06/2019 Daytime Tracking Survey	15:00 – 20:30	Black Waste Wood	238333 M. nattereri; 238349 N. leisleri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
07/06/2019 Emergence / Tracking Survey	21:00 – 23:00	Birches Wood	238353 P. auritus.	Wind 1 – 1 Air temp 12 – 10 Rain 0 – 0 Cloud 5 – 3
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
10/06/2019 Daytime Tracking Survey	14:30 – 18:30	Broadwells Wood	238335 M. brandtii; 238350 P. auritus; 238369 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
10/06/2019 Daytime Tracking Survey	14:30 – 18:30	Rough Knowles Wood	238351 N. noctula.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
10/06/2019 Emergence / Tracking Survey	21:06 – 23:26	Broadwells Wood	238350 P. auritus.	Wind 5 – 5 Air temp 13 – 9 Rain 1 – 4 Cloud 8 – 8
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
11/06/2019 Daytime Tracking Survey	14:00 – 18:00	Black Waste Wood	238333 M. nattereri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
11/06/2019 Emergence / Tracking Survey	21:10 – 23:30	Black Waste Wood	238333 M. nattereri.	Wind 4 – 4 Air temp 15 – 10 Rain 3 – 0 Cloud 8 – 8
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
12/06/2019 Daytime Tracking Survey	15:00 – 18:00	Black Waste Wood	238333 M. nattereri; 238349 N. leisleri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
12/06/2019 Daytime Tracking Survey	15:00 – 18:00	Rough Knowles Wood	238336 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
12/06/2019 Daytime Tracking Survey	17:30 – 20:00	Broadwells Wood	238335 M. brandtii; 238350 P. auritus; 238369 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
12/06/2019 Emergence / Tracking Survey	21:00 – 00:00	Rough Knowles Wood	238336 P. auritus.	Wind 2 – 3 Air temp 12 – 11 Rain 3 – 3 Cloud 8 – 8
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
12/06/2019 Emergence / Tracking Survey	21:07 – 23:00	Broadwells Wood	238369 P. auritus; 238335 M. brandtii; 238350 P. auritus.	Wind 2 – 2 Air temp 11 – 9 Rain 5 – 5 Cloud 8 – 8
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
13/06/2019 Daytime Tracking Survey	16:00 – 22:00	Black Waste Wood	238333 M. nattereri; 238349 N. leisleri.	N/A

2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
13/06/2019 Daytime Tracking Survey	16:00 – 22:00	Broadwells Wood	238335 M. brandtii; 238350 P. auritus; 238369 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
13/06/2019 Daytime Tracking Survey	16:00 – 22:00	Rough Knowles Wood	238336 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
14/06/2019 Daytime Tracking Survey	14:30 – 20:00	Black Waste Wood	238333 M. nattereri; 238349 N. leisleri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
14/06/2019 Daytime Tracking Survey	14:30 – 20:00	Broadwells Wood	238335 M. brandtii; 238350 P. auritus; 238369 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
14/06/2019 Daytime Tracking Survey	14:30 – 20:00	Rough Knowles Wood	238336 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
14/06/2019 Emergence / Tracking Survey	21:10 – 00:00	Broadwells Wood	238369 P. auritus; 238369 P. auritus.	Wind 2 – 2 Air temp 12 – 10 Rain 0 – 0 Cloud 8 – 8
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
19/06/2019 Daytime Tracking Survey	15:30 – 18:30	Black Waste Wood	239032 P. pygmaeus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
19/06/2019 Emergence / Tracking Survey	21:00 – 22:30	Black Waste Wood	239032 P. pygmaeus.	Wind 1 – 1 Air temp 17 – 14 Rain 0 – 0 Cloud 5 – 5
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
20/06/2019 Daytime Tracking Survey	16:00 – 19:30	Black Waste Wood	239032 P. pygmaeus; 239032 P. pygmaeus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
20/06/2019 Emergence / Tracking Survey	21:10 – 23:00	Black Waste Wood	239032 P. pygmaeus.	Wind 0 – 1 Air temp 15 – 13 Rain 0 – 0 Cloud 3 – 5
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
25/06/2019 Daytime Tracking Survey	14:00 – 16:10	Broadwells Wood	239033 M. mystacinus; 239037 M. nattereri; 239055 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
25/06/2019 Daytime Tracking Survey	17:35 – 19:00	Black Waste Wood	239032 P. pygmaeus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
25/06/2019 Emergence / Tracking Survey	21:00 – 23:15	Broadwells Wood	239033 M. mystacinus; 239037 M. nattereri; 239055 P. auritus.	Wind 1 – 1 Air temp 14 – 14 Rain 0 – 0 Cloud 8 – 8
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
26/06/2019 Daytime Tracking Survey	15:00 – 16:10	Broadwells Wood	239033 M. mystacinus; 239037 M. nattereri; 239055 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
26/06/2019 Daytime Tracking Survey	16:30 – 20:30	Rough Knowles Wood	238336 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				

26/06/2019 Emergence / Tracking Survey	21:00 – 23:50	Broadwells Wood	239055 P. auritus; 239033 M. mystacinus.	Wind 3 – 2 Air temp 13 – 12 Rain 0 – 0 Cloud 8 – 8
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
26/06/2019 Emergence / Tracking Survey	21:30 – 23:30	Broadwells Wood	238314 M. nattereri.	Wind 2 – 2 Air temp 13 – 12 Rain 0 – 0 Cloud 8 – 8
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
26/06/2019 Emergence / Tracking Survey	21:30 – 23:30	Rough Knowles Wood	238336 P. auritus.	Wind 2 – 2 Air temp 13 – 12 Rain 0 – 0 Cloud 8 – 8
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
27/06/2019 Daytime Tracking Survey	18:30 – 20:07	Broadwells Wood	239037 M. nattereri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
28/06/2019 Daytime Tracking Survey	16:00 – 20:15	Broadwells Wood	239033 M. mystacinus; 239037 M. nattereri; 239055 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
28/06/2019 Emergence / Tracking Survey	21:20 – 23:28	Broadwells Wood	239055 P. auritus.	Wind 0 – 1 Air temp 19 – 17 Rain 0 – 0 Cloud 2 – 2
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
02/07/2019 Daytime Tracking Survey	15:15 – 18:05	Rough Knowles Wood	239433 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
02/07/2019 Daytime Tracking Survey	18:00 – 21:00	Broadwells Wood	239041 M. mystacinus; 239042 M. brandtii.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
02/07/2019 Emergence / Tracking Survey	21:11 – 23:02	Rough Knowles Wood	239433 P. auritus.	Wind 1 – 1 Air temp 15 – 18 Rain 0 – 0 Cloud 2 – 1
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
02/07/2019 Emergence / Tracking Survey	21:30 – 00:00	Broadwells Wood	239041 M. mystacinus.	Wind 2 – 2 Air temp 13 – 13 Rain 0 – 0 Cloud 1 – 1
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
03/07/2019 Daytime Tracking Survey	15:00 – 19:15	Broadwells Wood	239039 P. auritus; 239041 M. mystacinus; 239042 M. brandtii; 239050 M. mystacinus.	N/A
3x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
04/07/2019 Daytime Tracking Survey	14:00 – 19:00	Broadwells Wood	239039 P. auritus; 239041 M. mystacinus; 239042 M. brandtii; 239043 N. noctula; 239050 M. mystacinus; 239058 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
04/07/2019 Daytime Tracking Survey	14:00 – 19:00	Rough Knowles Wood	239433 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				

04/07/2019 Emergence / Tracking Survey	20:45 – 23:30	Broadwells Wood	239058 P. auritus.	Wind 1 – 1 Air temp 19 – 17 Rain 0 – 0 Cloud 1 – 1
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
07/07/2019 Daytime Tracking Survey	16:00 – 21:00	Broadwells Wood	239039 P. auritus; 239041 M. mystacinus; 239042 M. brandtii; 239043 N. noctula; 239050 M. mystacinus; 239058 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
07/07/2019 Daytime Tracking Survey	16:00 – 21:00	Rough Knowles Wood	239433 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
07/07/2019 Daytime Tracking Survey	17:00 – 21:00	Rough Knowles Wood	239433 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
07/07/2019 Daytime Tracking Survey	17:00 – 21:00	Broadwells Wood	239039 P. auritus; 239041 M. mystacinus; 239042 M. brandtii; 239043 N. noctula; 239050 M. mystacinus; 239058 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
07/07/2019 Emergence / Tracking Survey	21:00 – 00:30	Rough Knowles Wood	239433 P. auritus.	Wind 0 – 2 Air temp 16 – 14 Rain 0 – 0 Cloud 2 – 2
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
07/07/2019 Emergence / Tracking Survey	21:15 – 23:30	Broadwells Wood	239039 P. auritus.	Wind 2 – 2 Air temp 20 – 14 Rain 0 – 0 Cloud 6 – 4
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
09/07/2019 Daytime Tracking Survey	17:00 – 21:00	Broadwells Wood	239039 P. auritus; 239041 M. mystacinus; 239042 M. brandtii; 239043 N. noctula; 239050 M. mystacinus; 239058 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
09/07/2019 Daytime Tracking Survey	17:00 – 21:00	Rough Knowles Wood	239433 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
09/07/2019 Emergence / Tracking Survey	21:13 – 23:38	Rough Knowles Wood	239433 P. auritus.	Wind 2 – 2 Air temp 19 – 17 Rain 0 – 0 Cloud 8 – 8
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
15/07/2019 Daytime Tracking Survey	16:30 – 21:00	Broadwells Wood	239039 P. auritus; 239050 M. mystacinus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
18/07/2019 Daytime Tracking Survey	15:40 – 19:30	Black Waste Wood	239430 P. auritus; 239871 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
18/07/2019 Emergence / Tracking Survey	22:45 – 23:45	Black Waste Wood	239430 P. auritus; 239871 P. auritus.	Wind 2 – 1 Air temp 15 – 13 Rain 0 – 0 Cloud 1 – 1

2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
19/07/2019 Daytime Tracking Survey	15:10 – 18:50	Black Waste Wood	239430 P. auritus; 239871 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
23/07/2019 Daytime Tracking Survey	14:00 – 16:40	Black Waste Wood	239430 P. auritus; 239871 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
25/07/2019 Daytime Tracking Survey	16:40 – 19:40	Black Waste Wood	239430 P. auritus; 239871 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
25/07/2019 Emergence / Tracking Survey	20:51 – 23:11	Black Waste Wood	239871 P. auritus; 239430 P. auritus.	Wind 4 – 4 Air temp 25 – 21 Rain 0 – 0 Cloud 5 – 5
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
29/07/2019 Daytime Tracking Survey	17:00 – 20:30	Black Waste Wood	239430 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
29/07/2019 Daytime Tracking Survey	17:00 – 20:30	Rough Knowles Wood	239439 M. nattereri; 239844 P. pygmaeus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
29/07/2019 Emergence / Tracking Survey	20:30 – 00:00	Rough Knowles Wood	239439 M. nattereri; 239844 P. pygmaeus.	Wind 0 – 1 Air temp 19 – 16 Rain 2 – 0 Cloud 7 – 8
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
30/07/2019 Daytime Tracking Survey	15:30 – 18:21	Black Waste Wood	239430 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
30/07/2019 Daytime Tracking Survey	15:30 – 18:21	Rough Knowles Wood	239439 M. nattereri; 239844 P. pygmaeus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
31/07/2019 Daytime Tracking Survey	15:30 – 18:57	Black Waste Wood	239430 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
31/07/2019 Daytime Tracking Survey	15:30 – 18:57	Rough Knowles Wood	239439 M. nattereri; 239844 P. pygmaeus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
31/07/2019 Emergence / Tracking Survey	20:30 – 23:11	Rough Knowles Wood	239439 M. nattereri.	Wind 3 – 2 Air temp 17 – 16 Rain 0 – 0 Cloud 8 – 4
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
01/08/2019 Daytime Tracking Survey	16:00 – 21:00	Rough Knowles Wood	239439 M. nattereri; 239844 P. pygmaeus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
01/08/2019 Emergence / Tracking Survey	21:00 – 22:00	Rough Knowles Wood	239439 M. nattereri.	Wind 3 – 3 Air temp 18 – 16 Rain 0 – 0 Cloud 8 – 8
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
02/08/2019 Daytime Tracking Survey	15:00 – 20:30	Rough Knowles Wood	239439 M. nattereri; 239844 P. pygmaeus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
05/08/2019 Daytime Tracking Survey	15:30 – 18:45	Rough Knowles Wood	239439 M. nattereri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				

05/08/2019 Emergence / Tracking Survey	20:30 – 22:58	Rough Knowles Wood	239439 M. nattereri.	Wind 1 – 3 Air temp 18 – 17 Rain 0 – 0 Cloud 2 – 2
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
09/08/2019 Daytime Tracking Survey	12:00 – 14:05	Birches Wood	240266 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
09/08/2019 Emergence / Tracking Survey	21:00 – 23:38	Birches Wood	240266 P. auritus.	Wind 1 – 5 Air temp 17 – 16 Rain 3 – 2 Cloud 8 – 7
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
11/08/2019 Daytime Tracking Survey	17:00 – 19:30	Birches Wood	240266 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
11/08/2019 Daytime Tracking Survey	17:00 – 19:30	Rough Knowles Wood	239439 M. nattereri; 239844 P. pygmaeus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
11/08/2019 Emergence / Tracking Survey	20:22 – 22:42	Birches Wood	240266 P. auritus.	Wind 2 – 2 Air temp 17 – 16 Rain 0 – 0 Cloud 6 – 6
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
15/08/2019 Daytime Tracking Survey	15:00 – 18:00	Rough Knowles Wood	239451 M. nattereri; 239456 M. nattereri; 239460 N. leisleri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
15/08/2019 Daytime Tracking Survey	16:30 – 19:30	Rough Knowles Wood	239460 N. leisleri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
15/08/2019 Emergence / Tracking Survey	20:00 – 22:00	Rough Knowles Wood	239451 M. nattereri.	Wind 1 – 1 Air temp 17 – 17 Rain 0 – 0 Cloud 2 – 1
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
15/08/2019 Emergence / Tracking Survey	20:00 – 22:30	Rough Knowles Wood	239456 M. nattereri.	Wind 1 – 2 Air temp 16 – 14 Rain 0 – 0 Cloud 2 – 2
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
16/08/2019 Daytime Tracking Survey	14:30 – 17:00	Rough Knowles Wood	239451 M. nattereri; 239456 M. nattereri; 239460 N. leisleri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
16/08/2019 Daytime Tracking Survey	17:30 – 20:30	Rough Knowles Wood	239460 N. leisleri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
23/08/2019 Daytime Tracking Survey	16:00 – 19:40	Broadwells Wood	240261 M. mystacinus; 240284 P. pipistrellus; 240285 M. brandtii; 240286 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
23/08/2019 Emergence / Tracking Survey	19:47 – 22:30	Broadwells Wood	240286 P. auritus; 240284 P. pipistrellus.	Wind 1 – 1 Air temp 19 – 18 Rain 0 – 0 Cloud 0 – 0
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				

25/08/2019 Daytime Tracking Survey	16:00 – 19:30	Black Waste Wood	240272 M. mystacinus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
25/08/2019 Daytime Tracking Survey	16:00 – 19:30	Broadwells Wood	240261 M. mystacinus; 240284 P. pipistrellus; 240285 M. brandtii; 240286 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
25/08/2019 Emergence / Tracking Survey	19:50 – 21:45	Black Waste Wood	240272 M. mystacinus.	Wind 2 – 0 Air temp 28 – 22 Rain 0 – 0 Cloud 0 – 1
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
26/08/2019 Daytime Tracking Survey	15:00 – 18:45	Broadwells Wood	240261 M. mystacinus; 240284 P. pipistrellus; 240285 M. brandtii; 240286 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
26/08/2019 Daytime Tracking Survey	15:15 – 18:30	Black Waste Wood	239442 N. noctula; 240272 M. mystacinus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
26/08/2019 Emergence / Tracking Survey	20:00 – 22:20	Broadwells Wood	240261 M. mystacinus; 240286 P. auritus; 240285 M. brandtii.	Wind 0 – 1 Air temp 21 – 19 Rain 0 – 0 Cloud 1 – 1
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
26/08/2019 Emergence / Tracking Survey	20:10 – 21:45	Broadwells Wood	240285 M. brandtii.	Wind 1 – 1 Air temp 25 – 23 Rain 0 – 0 Cloud 1 – 1
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
27/08/2019 Daytime Tracking Survey	15:00 – 19:00	Broadwells Wood	240261 M. mystacinus; 240284 P. pipistrellus; 240285 M. brandtii; 240286 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
27/08/2019 Daytime Tracking Survey	16:00 – 19:00	Black Waste Wood	239442 N. noctula; 240272 M. mystacinus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
27/08/2019 Emergence / Tracking Survey	20:00 – 22:30	Broadwells Wood	240284 P. pipistrellus; 240285 M. brandtii; 240261 M. mystacinus; 240286 P. auritus.	Wind 2 – 1 Air temp 16 – 15 Rain 0 – 0 Cloud 2 – 7
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
28/08/2019 Daytime Tracking Survey	15:30 – 18:45	Broadwells Wood	240261 M. mystacinus; 240284 P. pipistrellus; 240285 M. brandtii; 240286 P. auritus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
28/08/2019 Daytime Tracking Survey	16:00 – 19:00	Black Waste Wood	239442 N. noctula; 240272 M. mystacinus.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
28/08/2019 Emergence / Tracking Survey	20:15 – 22:30	Broadwells Wood	240286 P. auritus; 240284 P. pipistrellus; 240285 M. brandtii; 240261 M. mystacinus.	Wind 2 – 2 Air temp 12 – 12 Rain 3 – 2 Cloud 8 – 8
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
09/09/2019 Daytime Tracking Survey	14:30 – 17:30	Birches Wood	240289 M. mystacinus; 240319 N. leisleri.	N/A

2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
09/09/2019 Emergence / Tracking Survey	19:23 – 22:30	Birches Wood	240289 M. mystacinus.	Wind 1 – 1 Air temp 14 – 12 Rain 0 – 0 Cloud 8 – 5
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				
11/09/2019 Daytime Tracking Survey	14:30 – 18:45	Birches Wood	240289 M. mystacinus; 240319 N. leisleri.	N/A
2x Surveyors using radio telemetry equipment (Biotrack Sika + 3 element Yagi).				
11/09/2019 Emergence / Tracking Survey	19:13 – 21:03	Birches Wood	240319 N. leisleri.	Wind 1 – 1 Air temp 17 – 15 Rain 0 – 0 Cloud 2 – 2
2x Surveyors using Radio telemetry equipment (Biotrack Sika + 3 element Yagi), infra-red camera and bat detectors.				

Please provide surveyors names *(including Class Licence registration number if applicable)* and ensure the <u>above</u> table states the number of surveyors used for each survey visit undertaken.

Lead surveyors are all highly experienced bat ecologists who are covered by the overarching project licence to undertake licensable activities (bat trapping, handling and tagging). Some individuals are licensed and some typically work either as an accredited agent on the Named Ecologist's licence or under a project licence. Other related survey methodologies do not require a licence to be undertaken (tracking, emergence/ re-entry surveys). Second surveyor licence details have not been provided.

2018 Surveyors

BR5 Trapping & Tagging Survey Leads:

[redacted]

BR4 Daytime Tracking & BR1 Roost Characterisation Survey Leads:

[redacted]

Survey Assistants: [redacted]

2019 Surveyors

BR5 Trapping & Tagging Survey Leads:

[redacted]

BR4 Daytime Tracking & BR1 Roost Characterisation Survey Leads:

[redacted]

Survey Assistants: [redacted]

Please explain any constraints on the survey/s undertaken (time of year, cold weather, refused access, safety issues preventing access etc – justify as necessary and include evidence where required). If access was refused please provide evidence (letter/email) to demonstrate this.

Radio transmitters can fail for a variety of reasons, including adverse weather and damage from the bats grooming. During some surveys, tags were scratched off after two to three days, limiting data capture.

Weather conditions were appropriate on all trapping sessions. In cooler months, some trapping surveys were curtailed due to temperatures falling below 9°C as per licence conditions.

Bats are mobile species and may use a variety of roosts, commuting routes and foraging areas during their yearly life cycle, which is influenced by a range of factors such as breeding status, energetic requirements and the availability of prey. These surveys are considered suitable for providing a sufficient sampling effort (without disturbing the population adversely) to obtain information to assist in the location of key roosts potentially affected by the Scheme, and to thereby inform licensing requirements and the development of appropriate mitigation.

Access to some roost sites found through radio-tracking was not possible due to the roosts being located on land where access permission had not been possible to obtain. In these cases, bat movements could still be followed via radio-tracking from public roads. A limitation of radio-tracking studies relates to accuracy of positional fixes. Accuracy of fixes can be a common problem in studies of bats, particularly those species that have relatively large home ranges (Holland and Wilelski, 2009). Whilst methods such as bi-angulation / triangulation can provide relatively rapid and systematic location data for bats, studies have shown that due to variability of surveyor skill, especially at distance, positional fixes might only be accurate to >220 m^2 (Bontanida et al, 2002).

Also complete the following:

- If DNA analysis of droppings has been undertaken, please indicate below (Yes, No, N/A) and ensure that **Figure C5b** (if applicable – see below) details the locations where the samples were taken. Where long-eared bats are detected but cannot be identified to species level visually, DNA analysis of any droppings will be needed where grey long-eared bats may be present.

N/A – No droppings collected

- Please confirm that a walk over survey/check has been carried out within 3 months *prior* to application submission by a suitably experienced ecologist to ensure that conditions have not changed since the most recent survey was undertaken. Provide details of any changes to conditions and habitats and/or structures on site since the surveys were undertaken.

Date of walkover survey/check	All woodlands revisited in October 2019, latest date 31/10/2019
Details of any changes to conditions and habitats and/or structures, if there are no changes please insert 'None'	None

C6 Survey results: Summarise your findings in the tables below and cross reference to **Figure C6** (which must also include flight lines, access points, dimensions of existing roosts etc). If you did not undertake a specific survey type please add N/A to the relevant table/s. Raw data is to be appended to the Method Statement (including sonograms, DNA analysis results etc).

Roost t*ypes to be referenced as:* *Day, Night, Feeding Perch, Transitional, Satellite, Maternity, Hibernation confirmed, Foraging Area, Commuting Route, Swarming Site, Other*. See end of document for "Definitions" of these roosts.

When completing "**Notes/observations" include** reference *to direct observations, extent and age of droppings, presence of field signs, emergence or re-entry, echolocation analysis. Also include DNA results if applicable and include nil results)*

Visual inspection results

Date (e.g. format 01/06/13)	**Species and numbers**	**Roost type** *(to be consistent with the above listed types)*	**Structure reference** *(consistent with relevant figures and other text)*	**Roost location**	**Access points (include # of them)**	**Dimensions of existing roosts or explanation of where the roost is (as appropriate)**
Notes/observations:						

Provide further (brief) comments/explanation if required:

[See Figure C6a – Bat Roost Potential]

[See Figure C6c – Survey Results - Roosts]

Dusk survey results

Date (e.g. format 01/06/13)	**Start and end times**	**Species and numbers**	***Roost type*** *(to be consistent with the above listed types)*	**Structure reference** *(consistent with relevant figures and other text)*	**Roost location**	**Access points (include # of them)**	**Dimensions of existing roosts or explanation of where the roost is (as appropriate)**
05/09/2018	Start time: 19:29, end time: 21:44	P.pip x 1 confirmed emergence at 20:02	*Unknown*	KS-F001	Tree to east of Broadwell's Wood	*Unknown*	*Unknown*
05/09/2018	Start time: 19:29, end time: 21:44	P.pyg x 1 possible emergence at 20:08	*Unknown*	KS-F002	Tree to east of Broadwell's Wood	*Unknown*	*Unknown*
Notes/observations: Surveyor details not provided.							

Provide further (brief) comments/explanation if required:

N/A

Dawn Survey results

Date (e.g. format 01/06/13)	**Start and end times**	**Species and numbers**	**Roost type** *(to be consistent with the above listed types)*	**Structure reference** *(consistent with relevant figures and other text)*	**Roost location**	**Access points (include # of them)**	**Dimensions of existing roosts or explanation of where the roost is (as appropriate)**

N/A							
Notes/observations:							

Provide further (brief) comments/explanation if required:

N/A

'Other' results – please specify.

Table C6 'Other' Survey Results - ALBST day tracking and roost characterisation or night tracking
This Survey Results table (within Section C6) comprises the results of the surveys (as per the Other Survey Effort tables in C5b above). The key information includes the bat tracked, whether the bat was found or not, the time of any emergence and any other bats observed emerging from the same feature, and the location and designation of any PRFs identified. Further details of any PRFs or roosts (including the tree species and feature specifics) have been detailed in the Roost table in Section C7 below. Figure C6c shows the roosts identified through the ALBST surveys reported below.

Date	Survey Type	Bat Details	Result	Roost Ref	Roost Location
05/09/18	Daytime tracking	000242 P. auritus adult male from Broadwells Wood	PRF identified	242a	Broadwells Wood [redacted]
05/09/18	Daytime tracking	000326 P. auritus adult n/a female from Broadwells Wood	PRF identified	242a	Broadwells Wood [redacted]
05/09/18	Night tracking	000242 P. auritus adult male from Broadwells Wood	Activity recorded.		
05/09/18	Roost characterisation	000242 P. auritus adult male from Broadwells Wood	Emerged at 20:29 with 8 other bats	242a	Broadwells Wood [redacted]
05/09/18	Night tracking	000326 P. auritus adult n/a female from Broadwells Wood	Activity recorded.		
05/09/18	Roost characterisation	000326 P. auritus adult n/a female from Broadwells Wood	Emerged at 20:32	242a	Broadwells Wood [redacted]
06/09/18	Daytime tracking	000242 P. auritus adult male from Broadwells Wood	PRF identified	242c	Hurst Farm [redacted]
06/09/18	Daytime tracking	000326 P. auritus adult n/a female from Broadwells Wood	PRF identified	242c	Hurst Farm [redacted]
06/09/18	Daytime tracking	000341 P. pipistrellus adult n/a female from Broadwells Wood	PRF identified	341c	Red Lane [redacted]
06/09/18	Daytime tracking	000777 M. nattereri adult male from Broadwells Wood	PRF identified	777a	Broadwells Wood [redacted]
06/09/18	Daytime tracking	000777 M. nattereri adult male from Broadwells Wood	PRF identified	777b	Broadwells Wood [redacted]
06/09/18	Night tracking	000242 P. auritus adult male from Broadwells Wood	Activity recorded.		
06/09/18	Night tracking	000326 P. auritus adult n/a female from Broadwells Wood	Activity recorded.		

06/09/18	Night tracking	000341 P. pipistrellus adult n/a female from Broadwells Wood	Activity recorded.		
06/09/18	Night tracking	000777 M. nattereri adult male from Broadwells Wood	Activity recorded.		
06/09/18	Roost characterisation	000777 M. nattereri adult male from Broadwells Wood	Emerged at 21:03	777b	Broadwells Wood [redacted]
07/09/18	Daytime tracking	000242 P. auritus adult male from Broadwells Wood	PRF identified	242c	Hurst Farm [redacted]
07/09/18	Daytime tracking	000326 P. auritus adult n/a female from Broadwells Wood	PRF identified	242c	Hurst Farm [redacted]
07/09/18	Daytime tracking	000341 P. pipistrellus adult n/a female from Broadwells Wood	PRF identified	341c	Red Lane [redacted]
07/09/18	Daytime tracking	000777 M. nattereri adult male from Broadwells Wood	PRF identified	777c	Broadwells Wood [redacted]
07/09/18	Night tracking	000242 P. auritus adult male from Broadwells Wood	Activity recorded.		
07/09/18	Night tracking	000326 P. auritus adult n/a female from Broadwells Wood	Activity recorded.		
07/09/18	Night tracking	000341 P. pipistrellus adult n/a female from Broadwells Wood	Activity recorded.		
07/09/18	Night tracking	000777 M. nattereri adult male from Broadwells Wood	Activity recorded.		
07/09/18	Roost characterisation	000777 M. nattereri adult male from Broadwells Wood	Emerged at 20:40	777c	Broadwells Wood [redacted]
08/09/18	Daytime tracking	000326 P. auritus adult n/a female from Broadwells Wood	PRF identified	242c	Hurst Farm [redacted]
08/09/18	Daytime tracking	000777 M. nattereri adult male from Broadwells Wood	PRF identified	777b	Broadwells Wood [redacted]
08/09/18	Roost characterisation	000777 M. nattereri adult male from Broadwells Wood	Emerged at 20:18	777b	Broadwells Wood [redacted]
09/09/18	Daytime tracking	000326 P. auritus adult n/a female from Broadwells Wood	PRF identified	242c	Hurst Farm [redacted]
09/09/18	Daytime tracking	000341 P. pipistrellus adult n/a female from Broadwells Wood	PRF identified	341b	Red Lane, Burton Green [redacted]
09/09/18	Daytime tracking	000364 P. pipistrellus adult n/a female from Big Poors Wood	PRF identified	364a	Red Lane (NE) [redacted]
09/09/18	Daytime tracking	000777 M. nattereri adult male from Broadwells Wood	PRF identified	777b	Broadwells Wood [redacted]

09/09/18	Daytime tracking	000979 P. auritus adult male from Big Poors Wood	PRF identified	979a	Cromwell Road [redacted]
09/09/18	Night tracking	000326 P. auritus adult n/a female from Broadwells Wood	Activity recorded.		
09/09/18	Night tracking	000777 M. nattereri adult male from Broadwells Wood	Activity recorded.		
09/09/18	Night tracking	000979 P. auritus adult male from Big Poors Wood	Activity recorded.		
10/09/18	Daytime tracking	000326 P. auritus adult n/a female from Broadwells Wood	PRF identified	326a	Hurst Farm [redacted]
10/09/18	Daytime tracking	000341 P. pipistrellus adult n/a female from Broadwells Wood	PRF identified	341a	Red Lane, Burton Green [redacted]
10/09/18	Daytime tracking	000816 M. nattereri adult male from Big Poors Wood	PRF identified	816a	Big Poors Wood [redacted]
10/09/18	Daytime tracking	000856 M. nattereri adult male from Big Poors Wood	PRF identified	856a	Broadwells Wood [redacted]
10/09/18	Daytime tracking	000979 P. auritus adult male from Big Poors Wood	PRF identified	979b	Cromwell Lane [redacted]
10/09/18	Night tracking	000326 P. auritus adult n/a female from Broadwells Wood	Activity recorded.		
10/09/18	Night tracking	000341 P. pipistrellus adult n/a female from Broadwells Wood	Activity recorded.		
10/09/18	Night tracking	000816 M. nattereri adult male from Big Poors Wood	Activity recorded.		
10/09/18	Roost characterisation	000856 M. nattereri adult male from Big Poors Wood	Did not emerge		
10/09/18	Night tracking	000979 P. auritus adult male from Big Poors Wood	Activity recorded.		
11/09/18	Daytime tracking	000242 P. auritus adult male from Broadwells Wood	PRF identified	242d	Broadwells Wood [redacted]
11/09/18	Daytime tracking	000326 P. auritus adult n/a female from Broadwells Wood	PRF identified	326a	Hurst Farm [redacted]
11/09/18	Daytime tracking	000341 P. pipistrellus adult n/a female from Broadwells Wood	PRF identified	341a	Red Lane, Burton Green [redacted]
11/09/18	Daytime tracking	000777 M. nattereri adult male from Broadwells Wood	PRF identified	777d	Broadwells Wood [redacted]
11/09/18	Daytime tracking	000816 M. nattereri adult male from Big Poors Wood	PRF identified	816a	Big Poors Wood [redacted]
11/09/18	Daytime tracking	000856 M. nattereri adult male from Big Poors Wood	PRF identified	856a	Broadwells Wood [redacted]

11/09/18	Daytime tracking	000979 P. auritus adult male from Big Poors Wood	PRF identified	979b	Cromwell Lane [redacted]
12/09/18	Daytime tracking	000242 P. auritus adult male from Broadwells Wood	PRF identified	242b	Broadwells Wood [redacted]
12/09/18	Daytime tracking	000326 P. auritus adult n/a female from Broadwells Wood	PRF identified	242c	Hurst Farm [redacted]
12/09/18	Daytime tracking	000341 P. pipistrellus adult n/a female from Broadwells Wood	PRF identified	341d	Near Crackley Wood [redacted]
12/09/18	Daytime tracking	000777 M. nattereri adult male from Broadwells Wood	PRF identified	777b	Broadwells Wood [redacted]
12/09/18	Daytime tracking	000856 M. nattereri adult male from Big Poors Wood	PRF identified	856c	Broadwells Wood [redacted]
12/09/18	Roost characterisation	000816 M. nattereri adult male from Big Poors Wood	Emerged at 20:15	777b	Broadwells Wood [redacted]
13/09/18	Daytime tracking	000341 P. pipistrellus adult n/a female from Broadwells Wood	PRF identified	341b	Red Lane, Burton Green [redacted]
13/09/18	Daytime tracking	000777 M. nattereri adult male from Broadwells Wood	PRF identified	777b	Broadwells Wood [redacted]
13/09/18	Daytime tracking	000816 M. nattereri adult male from Big Poors Wood	PRF identified	816b	Big Poors Wood [redacted]
13/09/18	Daytime tracking	000856 M. nattereri adult male from Big Poors Wood	PRF identified	856b	Broadwells Wood [redacted]
13/09/18	Daytime tracking	000979 P. auritus adult male from Big Poors Wood	PRF identified	979c	Cromwell Lane [redacted]
14/09/18	Daytime tracking	000816 M. nattereri adult male from Big Poors Wood	PRF identified	816b	Big Poors Wood [redacted]
14/09/18	Daytime tracking	000979 P. auritus adult male from Big Poors Wood	PRF identified	979c	Cromwell Lane [redacted]
14/09/18	Roost characterisation	000856 M. nattereri adult male from Big Poors Wood	Emerged at 20:15	856b	Broadwells Wood [redacted]
25/09/18	Daytime tracking	000289 P. auritus adult male from Birches Wood	PRF identified	289a	Crackley Wood [redacted]
25/09/18	Roost characterisation	000289 P. auritus adult male from Birches Wood	Did not emerge		
25/09/18	Roost characterisation	000289 P. auritus adult male from Birches Wood	Emerged at 21:14 with 4 other bats	289a	Crackley Wood [redacted]
26/09/18	Daytime tracking	000289 P. auritus adult male from Birches Wood	PRF identified	289c	Crackley Wood North [redacted]
27/09/18	Daytime tracking	000289 P. auritus adult male from Birches Wood	PRF identified	289b	Crackley Wood North [redacted]

28/09/18	Daytime tracking	000696 M. nattereri adult n/a female from Rough Knowles Wood	PRF identified	696a	Rough Knowles Wood [redacted]
28/09/18	Daytime tracking	001777 M. nattereri adult n/a female from Rough Knowles Wood	PRF identified	696a	Rough Knowles Wood [redacted]
28/09/18	Roost characterisation	000696 M. nattereri adult n/a female from Rough Knowles Wood	Did not emerge		
28/09/18	Roost characterisation	001777 M. nattereri adult n/a female from Rough Knowles Wood	Emerged at 20:19 with 3 other bats	696a	Rough Knowles Wood [redacted]
01/10/18	Daytime tracking	000696 M. nattereri adult n/a female from Rough Knowles Wood	PRF identified	696b	Crackley Lane [redacted]
01/10/18	Daytime tracking	001204 M. nattereri immature male from Rough Knowles Wood	PRF identified	696a	Rough Knowles Wood [redacted]
01/10/18	Daytime tracking	001777 M. nattereri adult n/a female from Rough Knowles Wood	PRF identified	1777a	Rough Knowles Wood [redacted]
01/10/18	Night tracking	001204 M. nattereri immature male from Rough Knowles Wood	Activity recorded.		
01/10/18	Roost characterisation	001204 M. nattereri immature male from Rough Knowles Wood	Emerged at 19:54 with 4 other bats	696a	Rough Knowles Wood [redacted]
01/10/18	Roost characterisation	001777 M. nattereri adult n/a female from Rough Knowles Wood	Emerged at 19:54	1777a	Rough Knowles Wood [redacted]
02/10/18	Daytime tracking	001204 M. nattereri immature male from Rough Knowles Wood	PRF identified	696a	Rough Knowles Wood [redacted]
02/10/18	Daytime tracking	001777 M. nattereri adult n/a female from Rough Knowles Wood	PRF identified	696a	Rough Knowles Wood [redacted]
02/10/18	Roost characterisation	000696 M. nattereri adult n/a female from Rough Knowles Wood	Emerged at 19:30	NoRoost	[redacted]
02/10/18	Roost characterisation	000696 M. nattereri adult n/a female from Rough Knowles Wood	Emerged at 19:30 with 1 other bat	696b	Crackley Lane [redacted]
02/10/18	Night tracking	001204 M. nattereri immature male from Rough Knowles Wood	Activity recorded.		
02/10/18	Roost characterisation	001204 M. nattereri immature male from Rough Knowles Wood	Emerged at 19:36 with 1 other bat	696a	Rough Knowles Wood [redacted]

02/10/18	Night tracking	001777 M. nattereri adult n/a female from Rough Knowles Wood	Activity recorded.		
02/10/18	Roost characterisation	001777 M. nattereri adult n/a female from Rough Knowles Wood	Emerged at 19:20	696a	Rough Knowles Wood [redacted]
03/10/18	Daytime tracking	001204 M. nattereri immature male from Rough Knowles Wood	PRF identified	696a	Rough Knowles Wood [redacted]
03/10/18	Daytime tracking	001777 M. nattereri adult n/a female from Rough Knowles Wood	PRF identified	696a	Rough Knowles Wood [redacted]
03/10/18	Roost characterisation	000696 M. nattereri adult n/a female from Rough Knowles Wood	Did not emerge		
03/10/18	Roost characterisation	001204 M. nattereri immature male from Rough Knowles Wood	Emerged at 19:58	696a	Rough Knowles Wood [redacted]
03/10/18	Roost characterisation	001777 M. nattereri adult n/a female from Rough Knowles Wood	Emerged at 19:39 with 1 other bat	696a	Rough Knowles Wood [redacted]
05/10/18	Roost characterisation	000696 M. nattereri adult n/a female from Rough Knowles Wood	Did not emerge		
05/10/18	Roost characterisation	001777 M. nattereri adult n/a female from Rough Knowles Wood	Emerged at 20:18 with 3 other bats	696a	Rough Knowles Wood [redacted]
14/05/19	Daytime tracking	237053 P. auritus adult male from Black Waste Wood	PRF identified	237053a	Black Waste Wood [redacted]
14/05/19	Roost characterisation	237053 P. auritus adult male from Black Waste Wood	Emerged at 21:21 with 1 other bat	237053a	Black Waste Wood [redacted]
15/05/19	Daytime tracking	237053 P. auritus adult male from Black Waste Wood	PRF identified	237053a	Black Waste Wood [redacted]
15/05/19	Daytime tracking	237060 P. auritus adult pregnant female from Broadwells Wood	Tag detected, PRF unidentified	NoRoost	[redacted]
15/05/19	Daytime tracking	237061 M. nattereri adult male from Broadwells Wood	PRF identified	237061b	Broadwells Wood [redacted]
15/05/19	Roost characterisation	237053 P. auritus adult male from Black Waste Wood	Emerged at 22:30	237053a	Black Waste Wood [redacted]
15/05/19	Roost characterisation	237061 M. nattereri adult male from Broadwells Wood	Emerged at 22:52	237061b	Broadwells Wood [redacted]
16/05/19	Daytime tracking	237054 M. mystacinus adult parous female from Rough Knowles Wood	PRF identified	237054a	The Spring Estate [redacted]

16/05/19	Daytime tracking	237057 N. noctula adult nulliparous female from Rough Knowles Wood	Not found		
16/05/19	Daytime tracking	237060 P. auritus adult pregnant female from Broadwells Wood	Not found		
16/05/19	Daytime tracking	237061 M. nattereri adult male from Broadwells Wood	PRF identified	237061a	Broadwells Wood [redacted]
17/05/19	Daytime tracking	237054 M. mystacinus adult parous female from Rough Knowles Wood	PRF identified	237054a	The Spring Estate [redacted]
17/05/19	Daytime tracking	237057 N. noctula adult nulliparous female from Rough Knowles Wood	Not found		
17/05/19	Daytime tracking	237060 P. auritus adult pregnant female from Broadwells Wood	Not found		
17/05/19	Daytime tracking	237061 M. nattereri adult male from Broadwells Wood	PRF identified	237061c	Broadwells Wood [redacted]
27/05/19	Daytime tracking	237055 P. auritus adult male from Broadwells Wood	PRF identified	237055b	South Hurst Farm [redacted]
27/05/19	Daytime tracking	237062 P. auritus adult pregnant female from Broadwells Wood	PRF identified	237062a	South Hurst Farm [redacted]
27/05/19	Daytime tracking	238314 M. nattereri juvenile male from Broadwells Wood	PRF identified	238314b	Broadwells Wood [redacted]
27/05/19	Daytime tracking	238317 N. leisleri adult male from Broadwells Wood	PRF identified	238317b	Big Poors Wood [redacted]
27/05/19	Roost characterisation	238314 M. nattereri juvenile male from Broadwells Wood	Emerged at 22:25	238314b	Broadwells Wood [redacted]
28/05/19	Daytime tracking	237055 P. auritus adult male from Broadwells Wood	PRF identified	237055b	South Hurst Farm [redacted]
28/05/19	Daytime tracking	237062 P. auritus adult pregnant female from Broadwells Wood	PRF identified	237062a	South Hurst Farm [redacted]
28/05/19	Daytime tracking	238314 M. nattereri juvenile male from Broadwells Wood	PRF identified	238314c	Broadwells Wood [redacted]
28/05/19	Daytime tracking	238317 N. leisleri adult male from Broadwells Wood	Not found		
28/05/19	Roost characterisation	237055 P. auritus adult male from Broadwells Wood	Emerged at 21:50 with 5 other bats	237055b	South Hurst Farm [redacted]
28/05/19	Roost characterisation	237062 P. auritus adult pregnant female from Broadwells Wood	Emerged at 21:45	237062a	South Hurst Farm [redacted]

28/05/19	Roost characterisation	238314 M. nattereri juvenile male from Broadwells Wood	Emerged at 22:10	238314c	Broadwells Wood [redacted]
29/05/19	Daytime tracking	237055 P. auritus adult male from Broadwells Wood	PRF identified	237055a	Broadwells Wood [redacted]
29/05/19	Daytime tracking	237062 P. auritus adult pregnant female from Broadwells Wood	PRF identified	237062a	South Hurst Farm [redacted]
29/05/19	Daytime tracking	238314 M. nattereri juvenile male from Broadwells Wood	PRF identified	238314a	Broadwells Wood [redacted]
29/05/19	Daytime tracking	238317 N. leisleri adult male from Broadwells Wood	Not found		
29/05/19	Roost characterisation	237055 P. auritus adult male from Broadwells Wood	Did not emerge		
29/05/19	Roost characterisation	238314 M. nattereri juvenile male from Broadwells Wood	Emerged at 22:20	238314a	Broadwells Wood [redacted]
29/05/19	Roost characterisation	238317 N. leisleri adult male from Broadwells Wood	Activity recorded.		
03/06/19	Daytime tracking	237055 P. auritus adult male from Broadwells Wood	PRF identified	237055b	South Hurst Farm [redacted]
03/06/19	Daytime tracking	238314 M. nattereri juvenile male from Broadwells Wood	PRF identified	238314d	Broadwells Wood [redacted]
03/06/19	Daytime tracking	238317 N. leisleri adult male from Broadwells Wood	PRF identified	238317c	Whitefield Coppice [redacted]
03/06/19	Daytime tracking	238333 M. nattereri adult male from Black Waste Wood	Not found		
03/06/19	Daytime tracking	238349 N. leisleri adult male from Black Waste Wood	PRF identified	238349a	Black Waste Wood [redacted]
03/06/19	Night tracking	238349 N. leisleri adult male from Black Waste Wood	Activity recorded.		
05/06/19	Daytime tracking	238333 M. nattereri adult male from Black Waste Wood	Not found		
05/06/19	Daytime tracking	238335 M. brandtii adult parous female from Broadwells Wood	PRF identified	238335a	South Hurst [redacted]
05/06/19	Daytime tracking	238336 P. auritus adult pregnant female from Rough Knowles Wood	PRF identified	238336b	Roughknowles Wood [redacted]
05/06/19	Daytime tracking	238349 N. leisleri adult male from Black Waste Wood	PRF identified	238349b	Cromwell Lane [redacted]
05/06/19	Daytime tracking	238350 P. auritus adult parous female from Broadwells Wood	PRF identified	238350a	Broadwells Wood [redacted]

05/06/19	Daytime tracking	238351 N. noctula adult male from Rough Knowles Wood	Not found		
05/06/19	Night tracking	238335 M. brandtii adult parous female from Broadwells Wood	Activity recorded.		
05/06/19	Roost characterisation	238350 P. auritus adult parous female from Broadwells Wood	Emerged at 22:01 with 13 other bats	238350a	Broadwells Wood [redacted]
06/06/19	Daytime tracking	238335 M. brandtii adult parous female from Broadwells Wood	PRF identified	238335a	South Hurst [redacted]
06/06/19	Daytime tracking	238350 P. auritus adult parous female from Broadwells Wood	PRF identified	238350a	Broadwells Wood [redacted]
06/06/19	Daytime tracking	238352 N. noctula juvenile male from Birches Wood	Not found		
06/06/19	Daytime tracking	238353 P. auritus adult pregnant female from Birches Wood	PRF identified	238353a	Crackley Wood [redacted]
06/06/19	Night tracking	238349 N. leisleri adult male from Black Waste Wood	Activity recorded.		
06/06/19	Night tracking	238353 P. auritus adult pregnant female from Birches Wood	Activity recorded.		
07/06/19	Daytime tracking	238333 M. nattereri adult male from Black Waste Wood	Not found		
07/06/19	Daytime tracking	238335 M. brandtii adult parous female from Broadwells Wood	PRF identified	238335a	South Hurst [redacted]
07/06/19	Daytime tracking	238336 P. auritus adult pregnant female from Rough Knowles Wood	PRF identified	238336c	Roughknowles Wood [redacted]
07/06/19	Daytime tracking	238349 N. leisleri adult male from Black Waste Wood	Not found		
07/06/19	Daytime tracking	238350 P. auritus adult parous female from Broadwells Wood	PRF identified	238350a	Broadwells Wood [redacted]
07/06/19	Daytime tracking	238351 N. noctula adult male from Rough Knowles Wood	Not found		
07/06/19	Daytime tracking	238352 N. noctula juvenile male from Birches Wood	Not found		
07/06/19	Daytime tracking	238353 P. auritus adult pregnant female from Birches Wood	PRF identified	238353b	Crackley Wood [redacted]

07/06/19	Roost characterisation	238353 P. auritus adult pregnant female from Birches Wood	Emerged at 22:02	238353b	Crackley Wood [redacted]
10/06/19	Daytime tracking	238335 M. brandtii adult parous female from Broadwells Wood	PRF identified	238335a	South Hurst [redacted]
10/06/19	Daytime tracking	238350 P. auritus adult parous female from Broadwells Wood	PRF identified	238350c	Broadwells Wood [redacted]
10/06/19	Daytime tracking	238351 N. noctula adult male from Rough Knowles Wood	Not found		
10/06/19	Daytime tracking	238369 P. auritus adult pregnant female from Broadwells Wood	PRF identified	238369a	South Hurst Farm [redacted]
10/06/19	Roost characterisation	238350 P. auritus adult parous female from Broadwells Wood	Emerged at 21:29	238350c	Broadwells Wood [redacted]
11/06/19	Daytime tracking	238333 M. nattereri adult male from Black Waste Wood	PRF identified	238333a	Black Waste Wood [redacted]
11/06/19	Roost characterisation	238333 M. nattereri adult male from Black Waste Wood	Emerged at 21:41	238333a	Black Waste Wood [redacted]
12/06/19	Daytime tracking	238333 M. nattereri adult male from Black Waste Wood	PRF identified	238333a	Black Waste Wood [redacted]
12/06/19	Daytime tracking	238335 M. brandtii adult parous female from Broadwells Wood	PRF identified	238335a	South Hurst [redacted]
12/06/19	Daytime tracking	238336 P. auritus adult pregnant female from Rough Knowles Wood	PRF identified	238336a	Crackley Wood [redacted]
12/06/19	Daytime tracking	238349 N. leisleri adult male from Black Waste Wood	Not found		
12/06/19	Daytime tracking	238350 P. auritus adult parous female from Broadwells Wood	PRF identified	238350b	Broadwells Wood [redacted]
12/06/19	Daytime tracking	238369 P. auritus adult pregnant female from Broadwells Wood	PRF identified	238369a	South Hurst Farm [redacted]
12/06/19	Night tracking	238335 M. brandtii adult parous female from Broadwells Wood	Activity recorded.		
12/06/19	Roost characterisation	238336 P. auritus adult pregnant female from Rough Knowles Wood	Did not emerge		
12/06/19	Night tracking	238350 P. auritus adult parous female from Broadwells Wood	Activity recorded.		

12/06/19	Night tracking	238369 P. auritus adult pregnant female from Broadwells Wood	Activity recorded.		
13/06/19	Daytime tracking	238333 M. nattereri adult male from Black Waste Wood	Not found		
13/06/19	Daytime tracking	238335 M. brandtii adult parous female from Broadwells Wood	PRF identified	238335a	South Hurst [redacted]
13/06/19	Daytime tracking	238336 P. auritus adult pregnant female from Rough Knowles Wood	PRF identified	238336a	Crackley Wood [redacted]
13/06/19	Daytime tracking	238349 N. leisleri adult male from Black Waste Wood	Not found		
13/06/19	Daytime tracking	238350 P. auritus adult parous female from Broadwells Wood	Not found		
13/06/19	Daytime tracking	238369 P. auritus adult pregnant female from Broadwells Wood	Not found		
14/06/19	Daytime tracking	238333 M. nattereri adult male from Black Waste Wood	Not found		
14/06/19	Daytime tracking	238335 M. brandtii adult parous female from Broadwells Wood	Not found		
14/06/19	Daytime tracking	238336 P. auritus adult pregnant female from Rough Knowles Wood	Not found		
14/06/19	Daytime tracking	238349 N. leisleri adult male from Black Waste Wood	Not found		
14/06/19	Daytime tracking	238350 P. auritus adult parous female from Broadwells Wood	Not found		
14/06/19	Daytime tracking	238369 P. auritus adult pregnant female from Broadwells Wood	PRF identified	238369a	South Hurst Farm [redacted]
14/06/19	Night tracking	238369 P. auritus adult pregnant female from Broadwells Wood	Activity recorded.		
14/06/19	Roost characterisation	238369 P. auritus adult pregnant female from Broadwells Wood	Emerged at 22:26 with 11 other bats	238369a	South Hurst Farm [redacted]
19/06/19	Daytime tracking	239032 P. pygmaeus juvenile male from Black Waste Wood	PRF identified	239032c	Black Waste Wood [redacted]
19/06/19	Roost characterisation	239032 P. pygmaeus juvenile male from Black Waste Wood	Emerged at 21:24	239032c	Black Waste Wood [redacted]

20/06/19	Daytime tracking	239032 P. pygmaeus juvenile male from Black Waste Wood	PRF identified	239032c	Black Waste Wood [redacted]
20/06/19	Daytime tracking	239032 P. pygmaeus juvenile male from Black Waste Wood	PRF identified	239032a	Black Waste Wood [redacted]
20/06/19	Roost characterisation	239032 P. pygmaeus juvenile male from Black Waste Wood	Not observed		
25/06/19	Daytime tracking	239032 P. pygmaeus juvenile male from Black Waste Wood	Not found		
25/06/19	Daytime tracking	239033 M. mystacinus adult lactating female from Broadwells Wood	PRF identified	239033b	South Hurst [redacted]
25/06/19	Daytime tracking	239037 M. nattereri adult male from Broadwells Wood	PRF identified	239037a	Crackley Farm [redacted]
25/06/19	Daytime tracking	239055 P. auritus adult pregnant female from Broadwells Wood	PRF identified	239055c	Broadwells Wood [redacted]
25/06/19	Night tracking	239033 M. mystacinus adult lactating female from Broadwells Wood	Activity recorded.		
25/06/19	Night tracking	239037 M. nattereri adult male from Broadwells Wood	Activity recorded.		
25/06/19	Roost characterisation	239055 P. auritus adult pregnant female from Broadwells Wood	Emerged at 22:02	239055c	Broadwells Wood [redacted]
26/06/19	Daytime tracking	238336 P. auritus adult pregnant female from Rough Knowles Wood	Not found		
26/06/19	Daytime tracking	239033 M. mystacinus adult lactating female from Broadwells Wood	PRF identified	239033b	South Hurst [redacted]
26/06/19	Daytime tracking	239037 M. nattereri adult male from Broadwells Wood	PRF identified	239037a	Crackley Farm [redacted]
26/06/19	Daytime tracking	239055 P. auritus adult pregnant female from Broadwells Wood	PRF identified	239055b	South Hurst Farm [redacted]
26/06/19	Roost characterisation	238314 M. nattereri juvenile male from Broadwells Wood	Not observed		
26/06/19	Roost characterisation	238336 P. auritus adult pregnant female from Rough Knowles Wood	Not observed		
26/06/19	Roost characterisation	239033 M. mystacinus adult lactating female from Broadwells Wood	Emerged at 21:53	239033b	South Hurst [redacted]
26/06/19	Roost characterisation	239055 P. auritus adult pregnant female from Broadwells Wood	Emerged at 22:00	239055b	South Hurst Farm [redacted]

27/06/19	Daytime tracking	239037 M. nattereri adult male from Broadwells Wood	PRF identified	239037b	The Spring Estate [redacted]
28/06/19	Daytime tracking	239033 M. mystacinus adult lactating female from Broadwells Wood	PRF identified	239033a	South Hurst Farm [redacted]
28/06/19	Daytime tracking	239037 M. nattereri adult male from Broadwells Wood	PRF identified	239037b	The Spring Estate [redacted]
28/06/19	Daytime tracking	239055 P. auritus adult pregnant female from Broadwells Wood	PRF identified	239055a	Broadwells Wood [redacted]
28/06/19	Roost characterisation	239055 P. auritus adult pregnant female from Broadwells Wood	Emerged at 22:00 with 6 other bats	239055a	Broadwells Wood [redacted]
02/07/19	Daytime tracking	239041 M. mystacinus juvenile parous female from Broadwells Wood	Not found		
02/07/19	Daytime tracking	239042 M. brandtii adult parous female from Broadwells Wood	Not found		
02/07/19	Daytime tracking	239433 P. auritus adult male from Rough Knowles Wood	PRF identified	239433a	Roughknowles Wood [redacted]
02/07/19	Roost characterisation	239041 M. mystacinus juvenile parous female from Broadwells Wood	Activity recorded.		
02/07/19	Roost characterisation	239433 P. auritus adult male from Rough Knowles Wood	Emerged at 22:22 with 10 other bats	239433a	Roughknowles Wood [redacted]
03/07/19	Daytime tracking	239039 P. auritus adult lactating female from Broadwells Wood	Not found		
03/07/19	Daytime tracking	239041 M. mystacinus juvenile parous female from Broadwells Wood	Not found		
03/07/19	Daytime tracking	239042 M. brandtii adult parous female from Broadwells Wood	Not found		
03/07/19	Daytime tracking	239050 M. mystacinus adult parous female from Broadwells Wood	PRF identified	239033a	South Hurst Farm [redacted]
04/07/19	Daytime tracking	239039 P. auritus adult lactating female from Broadwells Wood	PRF identified	239039a	South Hurst Farm [redacted]
04/07/19	Daytime tracking	239041 M. mystacinus juvenile parous female from Broadwells Wood	PRF identified	239041a	Cromwell Lane [redacted]

04/07/19	Daytime tracking	239042 M. brandtii adult parous female from Broadwells Wood	Not found		
04/07/19	Daytime tracking	239043 N. noctula juvenile male from Broadwells Wood	Not found		
04/07/19	Daytime tracking	239050 M. mystacinus adult parous female from Broadwells Wood	PRF identified	239050b	South Hurst Farm [redacted]
04/07/19	Daytime tracking	239058 P. auritus adult lactating female from Broadwells Wood	PRF identified	239058a	Broadwells Wood [redacted]
04/07/19	Daytime tracking	239433 P. auritus adult male from Rough Knowles Wood	PRF identified	239433a	Roughknowles Wood [redacted]
04/07/19	Roost characterisation	239058 P. auritus adult lactating female from Broadwells Wood	Emerged at 21:41 with 14 other bats	239058a	Broadwells Wood [redacted]
07/07/19	Daytime tracking	239039 P. auritus adult lactating female from Broadwells Wood	PRF identified	239039a	South Hurst Farm [redacted]
07/07/19	Daytime tracking	239039 P. auritus adult lactating female from Broadwells Wood	PRF identified	239039b	South Hurst Farm [redacted]
07/07/19	Daytime tracking	239041 M. mystacinus juvenile parous female from Broadwells Wood	Not found		
07/07/19	Daytime tracking	239042 M. brandtii adult parous female from Broadwells Wood	Not found		
07/07/19	Daytime tracking	239043 N. noctula juvenile male from Broadwells Wood	Not found		
07/07/19	Daytime tracking	239050 M. mystacinus adult parous female from Broadwells Wood	PRF identified	239050a	South Hurst [redacted]
07/07/19	Daytime tracking	239050 M. mystacinus adult parous female from Broadwells Wood	PRF identified	239050a	South Hurst [redacted]
07/07/19	Daytime tracking	239058 P. auritus adult lactating female from Broadwells Wood	Not found		
07/07/19	Daytime tracking	239433 P. auritus adult male from Rough Knowles Wood	PRF identified	239433a	Roughknowles Wood [redacted]
07/07/19	Daytime tracking	239433 P. auritus adult male from Rough Knowles Wood	PRF identified	239433b	Roughknowles Wood [redacted]

07/07/19	Roost characterisation	239039 P. auritus adult lactating female from Broadwells Wood	Emerged at 21:15 with 24 other bats	239039b	South Hurst Farm [redacted]
07/07/19	Roost characterisation	239433 P. auritus adult male from Rough Knowles Wood	Not observed		
09/07/19	Daytime tracking	239039 P. auritus adult lactating female from Broadwells Wood	Not found		
09/07/19	Daytime tracking	239041 M. mystacinus juvenile parous female from Broadwells Wood	Not found		
09/07/19	Daytime tracking	239042 M. brandtii adult parous female from Broadwells Wood	Not found		
09/07/19	Daytime tracking	239043 N. noctula juvenile male from Broadwells Wood	Not found		
09/07/19	Daytime tracking	239050 M. mystacinus adult parous female from Broadwells Wood	PRF identified	239050a	South Hurst [redacted]
09/07/19	Daytime tracking	239058 P. auritus adult lactating female from Broadwells Wood	Not found		
09/07/19	Daytime tracking	239433 P. auritus adult male from Rough Knowles Wood	PRF identified	239433b	Roughknowles Wood [redacted]
09/07/19	Roost characterisation	239433 P. auritus adult male from Rough Knowles Wood	Did not emerge		
15/07/19	Daytime tracking	239039 P. auritus adult lactating female from Broadwells Wood	Not found		
15/07/19	Daytime tracking	239050 M. mystacinus adult parous female from Broadwells Wood	PRF identified	239050a	South Hurst [redacted]
18/07/19	Daytime tracking	239430 P. auritus adult lactating female from Black Waste Wood	PRF identified	239430a	Moat Farm [redacted]
18/07/19	Daytime tracking	239871 P. auritus adult parous female from Black Waste Wood	PRF identified	239871a	Red Lane - New Farm [redacted]
18/07/19	Night tracking	239430 P. auritus adult lactating female from Black Waste Wood	Activity recorded.		
18/07/19	Roost characterisation	239871 P. auritus adult parous female from Black Waste Wood	Did not emerge		

19/07/19	Daytime tracking	239430 P. auritus adult lactating female from Black Waste Wood	PRF identified	239430a	Moat Farm [redacted]
19/07/19	Daytime tracking	239871 P. auritus adult parous female from Black Waste Wood	PRF identified	239871a	Red Lane - New Farm [redacted]
23/07/19	Daytime tracking	239430 P. auritus adult lactating female from Black Waste Wood	PRF identified	239430a	Moat Farm [redacted]
23/07/19	Daytime tracking	239871 P. auritus adult parous female from Black Waste Wood	PRF identified	239871a	Red Lane - New Farm [redacted]
25/07/19	Daytime tracking	239430 P. auritus adult lactating female from Black Waste Wood	PRF identified	239430b	Burton Green Farm [redacted]
25/07/19	Daytime tracking	239871 P. auritus adult parous female from Black Waste Wood	PRF identified	239871a	Red Lane - New Farm [redacted]
25/07/19	Night tracking	239430 P. auritus adult lactating female from Black Waste Wood	Activity recorded.		
25/07/19	Night tracking	239871 P. auritus adult parous female from Black Waste Wood	Activity recorded.		
29/07/19	Daytime tracking	239430 P. auritus adult lactating female from Black Waste Wood	Not found		
29/07/19	Daytime tracking	239439 M. nattereri juvenile nulliparous female from Rough Knowles Wood	PRF identified	239439b	Roughknowles Wood [redacted]
29/07/19	Daytime tracking	239844 P. pygmaeus juvenile male from Rough Knowles Wood	PRF identified	239844b	South Hurst Farm [redacted]
29/07/19	Roost characterisation	239439 M. nattereri juvenile nulliparous female from Rough Knowles Wood	Emerged at 22:05	239439b	Roughknowles Wood [redacted]
29/07/19	Night tracking	239844 P. pygmaeus juvenile male from Rough Knowles Wood	Activity recorded.		
30/07/19	Daytime tracking	239430 P. auritus adult lactating female from Black Waste Wood	Not found		
30/07/19	Daytime tracking	239439 M. nattereri juvenile nulliparous female from Rough Knowles Wood	PRF identified	239439d	Roughknowles Wood [redacted]
30/07/19	Daytime tracking	239844 P. pygmaeus juvenile male from Rough Knowles Wood	PRF identified	239844a	South Hurst Farm [redacted]

31/07/19	Daytime tracking	239430 P. auritus adult lactating female from Black Waste Wood	Not found		
31/07/19	Daytime tracking	239439 M. nattereri juvenile nulliparous female from Rough Knowles Wood	PRF identified	239439d	Roughknowles Wood [redacted]
31/07/19	Daytime tracking	239844 P. pygmaeus juvenile male from Rough Knowles Wood	PRF identified	239844a	South Hurst Farm [redacted]
31/07/19	Roost characterisation	239439 M. nattereri juvenile nulliparous female from Rough Knowles Wood	Emerged at 21:47 with 17 other bats	239439d	Roughknowles Wood [redacted]
01/08/19	Daytime tracking	239439 M. nattereri juvenile nulliparous female from Rough Knowles Wood	PRF identified	239439c	South Hurst Farm [redacted]
01/08/19	Daytime tracking	239844 P. pygmaeus juvenile male from Rough Knowles Wood	Not found		
01/08/19	Roost characterisation	239439 M. nattereri juvenile nulliparous female from Rough Knowles Wood	Emerged at 21:24 with 2 other bats	239439c	South Hurst Farm [redacted]
02/08/19	Daytime tracking	239439 M. nattereri juvenile nulliparous female from Rough Knowles Wood	PRF identified	239439c	South Hurst Farm [redacted]
02/08/19	Daytime tracking	239844 P. pygmaeus juvenile male from Rough Knowles Wood	Not found		
05/08/19	Daytime tracking	239439 M. nattereri juvenile nulliparous female from Rough Knowles Wood	PRF identified	239439a	Roughknowles Wood [redacted]
05/08/19	Roost characterisation	239439 M. nattereri juvenile nulliparous female from Rough Knowles Wood	Emerged at 22:25	239439a	Roughknowles Wood [redacted]
09/08/19	Daytime tracking	240266 P. auritus adult parous female from Birches Wood	PRF identified	240266a	Roughknowles Wood [redacted]
09/08/19	Roost characterisation	240266 P. auritus adult parous female from Birches Wood	Did not emerge		
11/08/19	Daytime tracking	239439 M. nattereri juvenile nulliparous female from Rough Knowles Wood	Not found		
11/08/19	Daytime tracking	239844 P. pygmaeus juvenile male from Rough Knowles Wood	Not found		
11/08/19	Daytime tracking	240266 P. auritus adult parous female from Birches Wood	PRF identified	240266b	Roughknowles Wood [redacted]
11/08/19	Roost characterisation	240266 P. auritus adult parous female from Birches Wood	Emerged at 21:10 with 7 other bats	240266b	Roughknowles Wood [redacted]

15/08/19	Daytime tracking	239451 M. nattereri juvenile nulliparous female from Rough Knowles Wood	PRF identified	239451a	Roughknowles Wood [redacted]
15/08/19	Daytime tracking	239456 M. nattereri juvenile male from Rough Knowles Wood	PRF identified	239439d	Roughknowles Wood [redacted]
15/08/19	Daytime tracking	239460 N. leisleri juvenile male from Rough Knowles Wood	Not found		
15/08/19	Roost characterisation	239451 M. nattereri juvenile nulliparous female from Rough Knowles Wood	Emerged at 21:34	239451a	Roughknowles Wood [redacted]
15/08/19	Roost characterisation	239456 M. nattereri juvenile male from Rough Knowles Wood	Emerged at 21:11	239439d	Roughknowles Wood [redacted]
16/08/19	Daytime tracking	239451 M. nattereri juvenile nulliparous female from Rough Knowles Wood	PRF identified	239439d	Roughknowles Wood [redacted]
16/08/19	Daytime tracking	239456 M. nattereri juvenile male from Rough Knowles Wood	PRF identified	239439d	Roughknowles Wood [redacted]
16/08/19	Daytime tracking	239460 N. leisleri juvenile male from Rough Knowles Wood	Not found		
23/08/19	Daytime tracking	240261 M. mystacinus adult male from Broadwells Wood	PRF identified	240261a	Hob Lane [redacted]
23/08/19	Daytime tracking	240284 P. pipistrellus juvenile nulliparous female from Broadwells Wood	PRF identified	240284a	Amherst Road [redacted]
23/08/19	Daytime tracking	240285 M. brandtii adult male from Broadwells Wood	PRF identified	240285a	Cromwell Lane [redacted]
23/08/19	Daytime tracking	240286 P. auritus adult male from Broadwells Wood	PRF identified	240286a	Hurst Farm [redacted]
23/08/19	Roost characterisation	240284 P. pipistrellus juvenile nulliparous female from Broadwells Wood	Emerged at 20:29 with 1 other bat	240284a	Amherst Road [redacted]
23/08/19	Roost characterisation	240286 P. auritus adult male from Broadwells Wood	Activity recorded.		
25/08/19	Daytime tracking	240261 M. mystacinus adult male from Broadwells Wood	Not found		
25/08/19	Daytime tracking	240272 M. mystacinus juvenile nulliparous female from Black Waste Wood	PRF identified	240272a	Hob Lane [redacted]

25/08/19	Daytime tracking	240284 P. pipistrellus juvenile nulliparous female from Broadwells Wood	PRF identified	240284b	Beehive Hill [redacted]
25/08/19	Daytime tracking	240285 M. brandtii adult male from Broadwells Wood	PRF identified	240285b	Cromwell Lane [redacted]
25/08/19	Daytime tracking	240286 P. auritus adult male from Broadwells Wood	Not found		
25/08/19	Roost characterisation	240272 M. mystacinus juvenile nulliparous female from Black Waste Wood	Emerged at 20:51	240272a	Hob Lane [redacted]
26/08/19	Daytime tracking	239442 N. noctula adult parous female from Black Waste Wood	Not found		
26/08/19	Daytime tracking	240261 M. mystacinus adult male from Broadwells Wood	Not found		
26/08/19	Daytime tracking	240272 M. mystacinus juvenile nulliparous female from Black Waste Wood	Not found		
26/08/19	Daytime tracking	240284 P. pipistrellus juvenile nulliparous female from Broadwells Wood	PRF identified	240284c	Leighfield Road [redacted]
26/08/19	Daytime tracking	240285 M. brandtii adult male from Broadwells Wood	Not found		
26/08/19	Daytime tracking	240286 P. auritus adult male from Broadwells Wood	Not found		
26/08/19	Roost characterisation	240261 M. mystacinus adult male from Broadwells Wood	Not observed		
26/08/19	Roost characterisation	240285 M. brandtii adult male from Broadwells Wood	Did not emerge		
26/08/19	Roost characterisation	240285 M. brandtii adult male from Broadwells Wood	Not observed		
26/08/19	Roost characterisation	240286 P. auritus adult male from Broadwells Wood	Not observed		
27/08/19	Daytime tracking	239442 N. noctula adult parous female from Black Waste Wood	Not found		
27/08/19	Daytime tracking	240261 M. mystacinus adult male from Broadwells Wood	Not found		

27/08/19	Daytime tracking	240272 M. mystacinus juvenile nulliparous female from Black Waste Wood	Not found		
27/08/19	Daytime tracking	240284 P. pipistrellus juvenile nulliparous female from Broadwells Wood	Not found		
27/08/19	Daytime tracking	240285 M. brandtii adult male from Broadwells Wood	Not found		
27/08/19	Daytime tracking	240286 P. auritus adult male from Broadwells Wood	Not found		
27/08/19	Roost characterisation	240261 M. mystacinus adult male from Broadwells Wood	Not observed		
27/08/19	Roost characterisation	240284 P. pipistrellus juvenile nulliparous female from Broadwells Wood	Not observed		
27/08/19	Roost characterisation	240285 M. brandtii adult male from Broadwells Wood	Not observed		
27/08/19	Roost characterisation	240286 P. auritus adult male from Broadwells Wood	Not observed		
28/08/19	Daytime tracking	239442 N. noctula adult parous female from Black Waste Wood	Not found		
28/08/19	Daytime tracking	240261 M. mystacinus adult male from Broadwells Wood	Not found		
28/08/19	Daytime tracking	240272 M. mystacinus juvenile nulliparous female from Black Waste Wood	Not found		
28/08/19	Daytime tracking	240284 P. pipistrellus juvenile nulliparous female from Broadwells Wood	Not found		
28/08/19	Daytime tracking	240285 M. brandtii adult male from Broadwells Wood	Not found		
28/08/19	Daytime tracking	240286 P. auritus adult male from Broadwells Wood	Not found		
28/08/19	Night tracking	240261 M. mystacinus adult male from Broadwells Wood	Not observed		
28/08/19	Night tracking	240284 P. pipistrellus juvenile nulliparous female from Broadwells Wood	Not observed		

28/08/19	Night tracking	240285 M. brandtii adult male from Broadwells Wood	Not observed		
28/08/19	Night tracking	240286 P. auritus adult male from Broadwells Wood	Not observed		
09/09/19	Daytime tracking	240289 M. mystacinus adult male from Birches Wood	PRF identified	240289a	Common Lane [redacted]
09/09/19	Daytime tracking	240319 N. leisleri juvenile male from Birches Wood	Not found		
09/09/19	Night tracking	240289 M. mystacinus adult male from Birches Wood	Activity recorded.		
11/09/19	Daytime tracking	240289 M. mystacinus adult male from Birches Wood	Not found		
11/09/19	Daytime tracking	240319 N. leisleri juvenile male from Birches Wood	PRF identified	240319a	Crackley Wood [redacted]
11/09/19	Roost characterisation	240319 N. leisleri juvenile male from Birches Wood	Emerged at 19:54	240319a	Crackley Wood [redacted]

Provide further (brief) comments/explanation if required:

[See Figure C6b – Trapping Locations]

See Figure C6c – Roost Locations]

The results table above is a summary (basic) record of the results for each survey undertaken. These results detail all PRFs and roosts found to date within the licence area (and up to 3 km distant) through trapping and tracking. The results table above also reports on null survey results. In some cases where multiple surveys have tracked bats to the same roost, multiple grid references have been provided for the same roost. This is due to triangulation error during the survey being reported. The best grid reference (or alternatively an average of those provided from several surveys) has been determined during a review of all the identified roosts (using all survey data collected plus photos) and reported in the collated list of the roosts provided below in C7.

Significantly more data has been collected than is reported here, and each PRF (when found during daytime tracking) has also been photographed to assist with specific tree identification/along with tree marking.

C7 Interpretation/evaluation of survey results (also see the Bat Mitigation Guidelines section 5.8 and Figure 4 for conservation significance of roost type): Please complete the following table:

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Roost ID	Bats identified	No. of bats	Location	Roost Type	Conserva-tion Status
*N.B - A number of bats is provided if the roost is a confirmed roost and the bat was positively identified as roosting there. A * denotes a roost where the PRF was identified from daytime tracking but roost status was not confirmed through observation of emergence. † denotes a location outside the licensable area.*					
238350b	P. auritus adult parous female.	*	Tear-out in sycamore [redacted] In Broadwells Wood Outside impact area	Likely maternity	High

242a	P. auritus adult male, P. auritus adult n/a female.	10	Main trunk split in silver birch [redacted] In Broadwells Wood Outside impact area	Likely maternity	High
289a	P. auritus adult male.	5	Weld in common ash [redacted] In Crackley Wood Within direct impact area	Likely maternity	High
239055b	P. auritus adult pregnant female.	1	Barn [redacted] In South Hurst Farm Within indirect impact area	Maternity	High
239033a	M. mystacinus adult lactating female, M. mystacinus adult parous female.	*	Barn [redacted] In South Hurst Farm Within indirect impact area	Maternity	High
239033b	M. mystacinus adult lactating female.	1	Residential building [redacted] In South Hurst Outside impact area	Maternity	High
239039a	P. auritus adult lactating female.	*	Barn [redacted] In South Hurst Farm Within indirect impact area	Maternity	High
239039b	P. auritus adult lactating female.	25	Exit above green barn in barn [redacted] In South Hurst Farm Within indirect impact area	Maternity	High
239041a	M. mystacinus juvenile parous female.	*	Residential building [redacted] In Cromwell Lane Within indirect impact area	Maternity	High
239050a	M. mystacinus adult parous female.	*	Residential building [redacted] In South Hurst Outside impact area	Maternity	High
238369a	P. auritus adult pregnant female.	12	Barn [redacted] In South Hurst Farm Within indirect impact area	Maternity	High
239055a	P. auritus adult pregnant female.	7	Pedunculate oak [redacted] In Broadwells Wood Within direct impact area	Maternity	High
239055c	P. auritus adult pregnant female.	1	Not identified in hybrid / uncertain oak [redacted] In Broadwells Wood Within direct impact area	Maternity	High
240266b	P. auritus adult parous female.	8	Knot hole in pedunculate oak [redacted] In Rough Knowles Wood Outside impact area	Maternity	High
240266a	P. auritus adult parous female.	*	Lateral crack on major limb (in in pedunculate oak [redacted] In Rough Knowles Wood Within indirect impact area	Maternity	High
239058a	P. auritus adult lactating female.	15	Woodpecker hole in silver birch [redacted] In Broadwells Wood Outside impact area	Maternity	High
239433a	P. auritus adult male.	11	Lateral crack in lowest large l in pedunculate oak [redacted] In Rough Knowles Wood Outside impact area	Maternity	High
239844b	P. pygmaeus juvenile male.	*	Barn [redacted] In South Hurst Farm Outside impact area	Maternity	High

239844a	P. pygmaeus juvenile male.	*	Gaps under roof tiles or felt in residential building [redacted] In South Hurst Farm Within indirect impact area	Maternity	High
239439d	M. nattereri juvenile nulliparous female, M. nattereri juvenile nulliparous female, M. nattereri juvenile male.	19	Callus roll in sessile oak [redacted] In Rough Knowles Wood Within indirect impact area	Maternity	High
239439c	M. nattereri juvenile nulliparous female.	3	Residential building [redacted] In South Hurst Farm Outside impact area	Maternity	High
239050b	M. mystacinus adult parous female.	*	Barn [redacted] In South Hurst Farm Within indirect impact area	Maternity	High
238336c	P. auritus adult pregnant female.	*	Unknown species [redacted] In Rough Knowles Wood Outside impact area	Maternity	High
238353b	P. auritus adult pregnant female.	1	Split in pedunculate oak [redacted] In Crackley Wood Within indirect impact area	Maternity	High
238335a	M. brandtii adult parous female.	*	Gap between tiles and roof in residential building [redacted] In South Hurst Outside impact area	Maternity	High
238336a	P. auritus adult pregnant female.	*	Pedunculate oak [redacted] In Crackley Wood Within direct impact area	Maternity	High
237062a	P. auritus adult pregnant female.	1	Barn [redacted] In South Hurst Farm Outside impact area	Maternity	High
238336b	P. auritus adult pregnant female.	*	Pedunculate oak [redacted] In Rough Knowles Wood Outside impact area	Maternity	High
238350a	P. auritus adult parous female.	14	Woodpecker hole in pedunculate oak [redacted] In Broadwells Wood Outside impact area	Maternity	High
238353a	P. auritus adult pregnant female.	*	Knot hole in pedunculate oak [redacted] In Crackley Wood Within direct impact area	Maternity	High
696a	M. nattereri adult n/a female, M. nattereri immature male, M. nattereri adult n/a female.	6	Woodpecker holes in hybrid / uncertain oak [redacted] In Rough Knowles Wood Within indirect impact area	Maternity	High
238333a	M. nattereri adult male.	1	Tear-out in pedunculate oak [redacted] In Black Waste Wood Outside impact area	Day (Summer)	Low
237055b	P. auritus adult male.	6	Loft in barn [redacted] In South Hurst Farm Outside impact area	Day (Summer)	Low
1777a	M. nattereri adult n/a female.	1	Snapped limb in hybrid / uncertain oak [redacted] In Rough Knowles Wood Outside impact area	Day (Summer)	Low

237055a	P. auritus adult male.	*	Tear-out in silver birch [redacted], [redacted] In Broadwells Wood Outside impact area	Day (Summer)	Low
237053a	P. auritus adult male.	2	Split in pedunculate oak [redacted] In Black Waste Wood Outside impact area	Day (Summer)	Low
237061a	M. nattereri adult male.	*	Lifting bark in pedunculate oak [redacted] In Broadwells Wood Outside impact area	Day (Summer)	Low
237061b	M. nattereri adult male.	1	Lifting bark in hybrid / uncertain oak [redacted] In Broadwells Wood Within direct impact area	Day (Summer)	Low
237061c	M. nattereri adult male.	*	Hazard beam in pedunculate oak [redacted] In Broadwells Wood Within direct impact area	Day (Summer)	Low
238314a	M. nattereri juvenile male.	1	Woodpecker hole in common ash [redacted] In Broadwells Wood Outside impact area	Day (Summer)	Low
238314b	M. nattereri juvenile male.	1	Tear-out in sycamore [redacted] In Broadwells Wood Outside impact area	Day (Summer)	Low
239032a	P. pygmaeus juvenile male.	*	Silver birch [redacted] In Black Waste Wood Outside impact area	Day (Summer)	Low
238314d	M. nattereri juvenile male.	*	Unknown species [redacted] In Broadwells Wood Outside impact area	Day (Summer)	Low
238350c	P. auritus adult parous female.	1	Pedunculate oak [redacted] In Broadwells Wood Outside impact area	Day (Summer)	Low
239032c	P. pygmaeus juvenile male.	1	Common ash [redacted] In Black Waste Wood Outside impact area	Day (Summer)	Low
239433b	P. auritus adult male.	1	Tear-out in pedunculate oak [redacted] In Rough Knowles Wood Within indirect impact area	Day (Summer)	Low
239439b	M. nattereri juvenile nulliparous female.	1	Knot hole in pedunculate oak [redacted] In Rough Knowles Wood Outside impact area	Day (Summer)	Low
238314c	M. nattereri juvenile male.	1	Pedunculate oak [redacted] In Broadwells Wood Outside impact area	Day (Summer)	Low
777d	M. nattereri adult male.	*	Undescribed feature in unknown species [redacted] In Broadwells Wood Outside impact area	Day (Summer)	Low
979b	P. auritus adult male.	*	Undescribed feature in house [redacted] In Cromwell Lane Within direct impact area	Day (Summer)	Low
979c	P. auritus adult male.	*	Undescribed feature in residential property [redacted] In Cromwell Lane Outside impact area	Day (Summer)	Low

777a	M. nattereri adult male.	0	Scarf with flaking bark along t in sweet chestnut [redacted] In Broadwells Wood Within indirect impact area	Day (Summer)	Low
777b	M. nattereri adult male, M. nattereri adult male.	2	Split in silver birch [redacted] In Broadwells Wood Outside impact area	Day (Summer)	Low
777c	M. nattereri adult male.	1	Branch in silver birch [redacted], [redacted] In Broadwells Wood Outside impact area	Day (Summer)	Low
816a	M. nattereri adult male.	*	Undescribed feature in unknown species [redacted] In Big Poors Wood Outside impact area	Day (Summer)	Low
816b	M. nattereri adult male.	*	Undescribed feature in unknown species [redacted] In Big Poors Wood Within indirect impact area	Day (Summer)	Low
856a	M. nattereri adult male.	*	Undescribed feature in unknown species [redacted] In Broadwells Wood Outside impact area	Day (Summer)	Low
856b	M. nattereri adult male.	1	Undescribed feature in hybrid / uncertain oak [redacted] In Broadwells Wood Outside impact area	Day (Summer)	Low
856c	M. nattereri adult male.	*	Wound in common alder [redacted] In Broadwells Wood Outside impact area	Day (Summer)	Low
979a	P. auritus adult male.	*	Undescribed feature in house [redacted] In Cromwell Road Outside impact area	Day (Summer)	Low
239451a	M. nattereri juvenile nulliparous female.	*	Pedunculate oak [redacted] In Rough Knowles Wood Within direct impact area	Day (Summer)	Low
240319a	N. leisleri juvenile male.	1	Tear-out in silver birch [redacted] In Crackley Wood Outside impact area	Day (Summer)	Moderate
238317b	N. leisleri adult male.	*	Unknown species [redacted] In Big Poors Wood Outside impact area	Day (Summer)	Moderate
289c	P. auritus adult male.	*	Unknown species [redacted] In Crackley Wood North Outside impact area	Unknown	Unknown
289b	P. auritus adult male.	*	Unknown species [redacted] In Crackley Wood North Outside impact area	Unknown	Unknown
239439a	M. nattereri juvenile nulliparous female.	1	Sessile oak [redacted] In Rough Knowles Wood Outside impact area	Unknown	Unknown
KS-F002	Untagged bat.	1	Chimney-like hole in trunk in unknown species [redacted] In Hedgerow east of Broadwells Woo Within direct impact area	Unknown	Unknown
KS-F001	Untagged bat.	1	Large hole on south side in unknown species [redacted]	Unknown	Unknown

			In Hedgerow east of Broadwells Woo Within direct impact area		
242b	P. auritus adult male.	*	Unknown species [redacted] In Broadwells Wood Outside impact area	Unknown	Unknown
242d	P. auritus adult male.	*	Undescribed feature in unknown species [redacted] In Broadwells Wood Outside impact area	Unknown	Unknown
239871a †	P. auritus adult parous female.	*	Residential building [redacted] In Red Lane - New Farm Outside impact area	Maternity	High
239430b †	P. auritus adult lactating female.	*	Barn [redacted] In Burton Green Farm Outside impact area	Maternity	High
237054a †	M. mystacinus adult parous female.	*	Residential building [redacted] In The Spring Estate Outside impact area	Maternity	High
239430a †	P. auritus adult lactating female.	*	Cart-lodge [redacted] In Moat Farm Outside impact area	Maternity	High
696b †	M. nattereri adult n/a female.	2	Woodpecker hole in hybrid / uncertain oak [redacted] In Crackley Lane Outside impact area	Day (Summer)	Low
240261a †	M. mystacinus adult male.	*	Unknown species [redacted] In Hob Lane Outside impact area	Day (Summer)	Low
240272a †	M. mystacinus juvenile nulliparous female.	1	Residential building [redacted] In Hob Lane Outside impact area	Day (Summer)	Low
240284a †	P. pipistrellus juvenile nulliparous female.	2	Gaps under roof tiles or felt in residential building [redacted] In Amherst Road Outside impact area	Day (Summer)	Low
240284b †	P. pipistrellus juvenile nulliparous female.	*	Residential building [redacted] In Beehive Hill Outside impact area	Day (Summer)	Low
240284c †	P. pipistrellus juvenile nulliparous female.	*	Unknown species [redacted] In Leighfield Road Outside impact area	Day (Summer)	Low
326a †	P. auritus adult n/a female.	*	Undescribed feature in building [redacted] In Hurst Farm Outside impact area	Day (Summer)	Low
240286a †	P. auritus adult male.	*	Barn [redacted] In Hurst Farm Outside impact area	Day (Summer)	Low
364a †	P. pipistrellus adult n/a female.	*	Undescribed feature in house [redacted] In Red Lane (NE) Outside impact area	Day (Summer)	Low
240289a †	M. mystacinus adult male.	*	Residential building [redacted] In Common Lane Outside impact area	Day (Summer)	Low
239037b †	M. nattereri adult male.	*	Unknown species [redacted] In The Spring Estate	Day (Summer)	Low

			Outside impact area		
239037a †	M. nattereri adult male.	*	Unknown species [redacted] In Crackley Farm Outside impact area	Day (Summer)	Low
238317c †	N. leisleri adult male.	*	Unknown species [redacted] In Whitefield Coppice Outside impact area	Day (Summer)	Moderate
240285a †	M. brandtii adult male.	*	Unusual access point in residential building [redacted] In Cromwell Lane Outside impact area	Day (Summer)	Moderate
238349a †	N. leisleri adult male.	*	Unknown species [redacted] In Black Waste Wood Outside impact area	Day (Summer)	Moderate
238349b †	N. leisleri adult male.	*	Clay tile cladding in residential building [redacted] In Cromwell Lane Outside impact area	Day (Summer)	Moderate
240285b †	M. brandtii adult male.	*	Residential building [redacted] In Cromwell Lane Outside impact area	Day (Summer)	Moderate
341a †	P. pipistrellus adult n/a female.	*	Undescribed feature in common ash [redacted] In Red Lane, Burton Green Outside impact area	Unknown	Unknown
341d †	P. pipistrellus adult n/a female.	*	Building [redacted] In Near Crackley Wood Outside impact area	Unknown	Unknown
341b †	P. pipistrellus adult n/a female.	*	Undescribed feature in residential property [redacted] In Red Lane, Burton Green Outside impact area	Unknown	Unknown
242c †	P. auritus adult male, P. auritus adult n/a female.	*	Undescribed feature in barn [redacted] In Hurst Farm Outside impact area	Unknown	Unknown
341c †	P. pipistrellus adult n/a female.	*	Undescribed feature in residential property [redacted] In Red Lane Outside impact area	Unknown	Unknown

Provide further (brief) comments / explanation if required:

With reference to Table C7 above - as per Bat Mitigation Guidelines, for the purposes of impact assessment and mitigation design, all roosts containing subadult bats of any sex where more than one bat was present, or pregnant, lactating or post-lactating female bats (with no evidence to the contrary such as those proven to share a roost with other subadults or females through radio tracking) were assumed to be from a unique maternity roost within the woodland, regardless of whether they were tagged and / or tracked back to a roost.

Approach to evaluation and interpretation of results

Both capture and known roost data collected during the surveys is used to formulate a risk assessment of bats likely to be present during tree felling/clearance works. The survey data is able to confirm what bats are known to roost in the woodland as well as other tree roosting bats visiting the site at the time of the surveys, as these bats could also be roosting at the site at other times of the year, given the highly mobile behaviour of tree roosting bats. Given this risk factor, a licence will be sought and mitigation provided for the entire tree roosting species assemblage using the site to ensure that all species likely to be roosting can be appropriately considered and safeguarded during the tree felling operations (i.e. suitable mitigation and bat rescue procedures). In addition, the Kenilworth sites licence area as a whole will also be considered as a roosting

resource for bats based primarily on the results of tracking data to provide a level of importance of the site at a landscape scale.

Summary of 2018/2019 Initial (visual) Tree Assessment Results

[See Figure C6a – Bat Roost Potential]

The Kenilworth sites were subject to ground level tree assessments and tree climbing inspection surveys to assess the potential of trees within the woodland and within 20 m of the LLAU for their potential to support bats.

Impact Area	Direct Impact Area	Indirect Impact Area	Outside Impact Area
High	107	49	20
Moderate	584	141	29
Low*	~800	~220	59

*~ Broadwells Wood was surveyed by a third-party contractor who did not record the co-ordinates of low potential trees. Therefore the distribution of the low potential trees has been arbitrarily assigned using a GIS based approach.

An area of 24.56 ha was assessed (incorporating the direct and indirect impact zones plus a small buffer) with every tree surveyed. Approximately 2934 trees were assessed within the licence area as detailed in the summary table above.

Summary of 2018/2019 Survey Results

[See Figure C6b – Trapping Locations]

[See Figure C6c – Roost Locations]

[See Figure C6d – Connectivity]

In 2018 and 2019, Advanced Licence Bat Survey Techniques (ALBSTs) were employed to gain a picture of the assemblage of bats using the woodland, locate roosts of bats within the woodland, and inform licensing and mitigation requirements.

As a bat roosting habitat, the Kenilworth sites form a relatively large and well connected woodland resource in the local landscape for local bat populations. This provides a wide variety of foraging and roosting opportunities for tree dwelling bat species.

The bat assemblage at the Kenilworth sites as represented by the bats trapped (with numbers caught) is presented in the summary table below:

Bat Species	No of bats
P. auritus	47
P. pipistrellus	35
M. mystacinus	28
P. pygmaeus	28
M. nattereri	16
N. noctula	7
M. mystacinus / brandtii	7
M. brandtii	6
N. leisleri	4

The data obtained during the course of the ALBST surveys detailed above suggests that the Kenilworth sites regularly supports eight species - common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*P. pygmaeus*), brown long-eared bat (*Plecotus auritus*), noctule (*Nyctalus noctula*) (no roosts identified), Natterer's bat (*M. nattereri*), Leisler's bat (*M. leisleri*) whiskered bat (*M. mystacinus*) and Brandt's (*M. brandtii*). However combined with desk study records, 11 species could potentially be present in the woodlands of the site, including Nathusius pipistrelle, barbastelle and Daubenton's bat. Serotine bat is not a tree roosting bat and Nathusius'

pipistrelle has not been identified within woodlands onsite (and only one individual found in the wider area) – these bats are not expected to be encountered within roosts during the tree felling works at Kenilworth and therefore are not considered further for this licence.

The tree roosts identified by species and where these lie relative to the impact zone (direct, indirect or outside the impact zone) are detailed in the table below. Four species were found to be roosting within trees in the licence area. Another four species were roosting in trees but outside the licence area, these are outlined in the table below.

Bat Species	Direct High	Direct Low	Indirect High	Indirect Low	Outside Impact Zone High	Outside Impact Zone Low
M. nattereri	0	3	2	2	1	15
N. leisleri	0	0	0	0	2	0
P. auritus	5	0	2	1	12	3
P. pipistrellus	1	0	0	0	0	0
P. pygmaeus	1	0	0	0	0	2

Outside = outside impact area, within licence area

Unlicensed = outside licence area

High / Low = conservation status of roost

Species found through ALBST but mainly roosting outside the impact zone of the Scheme were Brandt's bat, Leisler's bat and common pipistrelle using a range of trees and buildings. Whiskered bats were not found roosting within trees (only within buildings) within the impact areas. Overall the tree roosts identified by the ALBST surveys which fall within the impact zone and are considered to require mitigation are as follows:

Bat Species	Conservation Value	Directly affected	Indirectly affected
M. nattereri	Low	3	2
M. nattereri	Moderate, High or Unknown	0	2
P. auritus	Low	0	1
P. auritus	Moderate, High or Unknown	5	2
P. pipistrellus	Moderate, High or Unknown	1	0
P. pygmaeus	Moderate, High or Unknown	1	0

In conclusion at the landscape scale, the Kenilworth sites licence area is considered of District importance for tree roosting bats.

Roosts found outside the licence area or within buildings

36 roosts were found within buildings or structures through ALBST. 27 were identified outside the impact zone and / or licence area. The following table details all roosts within buildings identified by the ALBST surveys:

Roosts within buildings (outside this licence)

Bat Species roosting in buildings	Total	Direct Impact Zone		Indirect Impact Zone		Within licence area		Outside licence area	
		Maternity	Low	Maternity	Low	Maternity	Low	Maternity	Low
M. brandtii	3	0	0	0	0	1	0	2	0
M. mystacinus	8	0	0	3	0	2	0	1	2
M. nattereri	1	0	0	0	0	1	0	0	0
N. leisleri	1	0	0	0	0	0	0	1	0

P. auritus	15	0	1	4	0	1	3	3	3
P. pipistrellus	6	0	0	0	0	0	0	1	5
P. pygmaeus	2	0	0	1	0	1	0	0	0
Total	**36**	**0**	**1**	**8**	**0**	**6**	**3**	**8**	**10**

The Kenilworth sites area is clearly an important foraging resource for these bats found roosting within buildings. One roost falling within the direct impact zone lies within a house on Cromwell Lane; this location is not due for clearance and the imprecision of the grid reference due to the lack of land access for private residences when surveying mean that is likely the true location of this roost is within the indirect impact zone and is thus not affected. Connectivity to foraging habitat is also unaffected due to its location. It should be noted that the South Hurst Farm complex (see Figure C6c South Hurst Farm) supports 14 roosts of which 13 are breeding roosts; seven of these maternity roosts fall into the indirect impact zone. This location is within the impact zone due to the presence of a construction traffic route for the Kenilworth sites area; however no clearance or construction works are planned that might affect these roosts, and their connectivity to significant retained woodland (comprising much of the assumed core sustenance zone) is unaffected by clearance works. Impacts on FCS from disturbance to these maternity roosts are therefore not anticipated.

All roosts identified by ALBST found within buildings or within trees and within the impact area of the Scheme but falling outside the licence area are formally notified to HS2. Impacts to any building roosts found within the impact zones of the Scheme are assessed at the detailed design stage within Written Statements, and mitigation prescribed as required. This information is then supplied to the team (WP54) writing the other licences (HS2 low / moderate impact class licences or traditional licences) for inclusion in their licence submissions. This process ensures that all impacted roosts are addressed under a suitable licence. As such, further consideration of these roosts within this Method Statement and licence application has not been made.

Important Advice:

Survey maps that must be included in this section of the Method Statement, or as separate documents if preferred, are listed in *section I "Map checklist" at the end of this document.*

Insert survey figures, photographs etc below here if not submitting them as separate documents:

D: Impact assessment <u>in absence of mitigation or compensation for each species / roost type</u>

(also see section 6 of the Bat Mitigation Guidelines). Where appropriate you must take into consideration cumulative impacts of your proposals on the bat species and populations identified in your survey in each section.

Guidance on quantifying roosts for the purpose of licensing: *To be considered the same roost, the locations need to have the same **functional** and **qualitative** (e.g. physical) characteristics, be used by the **same species** for the **same purpose** (e.g. day roosting) and be within the **same building / structure**. If the physical characteristics are different (e.g. one roost is in external crevices in the wall and the other is in the roof void against internal timbers) then they should be considered different roosts - because they offer bats different roosting opportunities. If the physical characteristics are similar and provide the same functional characteristics, used by the same species for the same purpose (e.g. transitional roost) but with different individual roosting locations within the overall building / structure, that could be considered one transitional roost. If two species are using an area which provides the same characteristics, for the same function, it is still two roosts - as there are two species.*

D1 Initial impacts: The impact/s of activities undertaken on site pre-development and during works must be considered and explained. **Consider disturbance** (such as human presence, noise, vibration, dust, lighting, access obstruction due to scaffolding and plastic sheeting etc), **temporary damage and temporary loss of roosts and injuring/killing.**

E.g. Unsupervised contractor removing roof tiles has the potential to crush 3 common pipistrelle bats using the roof tiles as day roosts. Major negative impact at a site level; Demolition of an extension to a building will take place adjacent to a maternity roost of common pipistrelle bats situated under the soffit board of the retained building. Potential for significant disturbance if demolition works are undertaken during the maternity period through vibration, noise and dust. Medium negative impact on a local level.

<u>Direct and Indirect Impacts – definition of assessment zones</u>

The LLAU defines the direct impact zone, and covers all potential land required during the construction phase of the Scheme, including the Limits Of Deviation (LOD – the land directly required for the route itself), other construction works such as site compounds and new access or haul roads. It also covers areas where no destructive works will occur such as use of existing roads required for access, and areas for beneficial works comprising woodland enhancement and habitat creation. The LLAU is effectively a worst-case scenario for assessing direct impacts and is applied in the absence of further site-specific knowledge and requisite detail of planned works.

Parts of the Kenilworth sites lie directly adjacent to the defined LLAU. However the works in some of these LLAU areas comprise woodland habitat creation. For example the majority of Black Waste Wood (84%) is within the LLAU however the only works that will occur here are woodland enhancement works. To ensure the impact assessment does not overestimate the actual impacts of the works within the LLAU on the woodland, we have assumed that (where this seems reasonable) there will be no negative impacts from woodland creation or habitat management works. We have therefore focussed the assessment of impacts on the known tree clearance areas that will enable the construction of the Scheme. The impact zone assessed is shown clearly in Figure Da, with impacted roosts highlighted. The vegetation clearance to be undertaken is shown in more detail in Appendix D Construction Stage Masterplan.

For this assessment, the indirect impact zone is defined as a 20 m buffer on the direct impact zone. The 20 m buffer has been agreed through consultation with HS2, our client LM's ecologists (DJV) and AECOM ecologists. It represents professional judgement and consensus agreement. Retained woodland will buffer impacts from the Scheme significantly over other habitat types, as the mature trees and shrubs present will filter air turbulence, noise, dust and light pollution, reducing the area of the impacted zone significantly.

Impact Assessment

This licence application relates to the clearance of trees and vegetation, required to facilitate construction works. The direct impacts assessed and mitigated for within this licence application will occur at the point when trees and vegetation are cleared (i.e. at the Enabling Works or pre-construction stage).

The Kenilworth sites as a whole are considered to be of District importance for tree roosting bats, with eight species of bat confirmed regularly using the site, and another three species potentially using the site, which represents a moderate level of diversity within the EWC North area (when compared with other ALBST surveyed woodlands across the Scheme).

Given the size of the licence area, the impacts have been split into general impacts affecting all woodlands within the licence area (these are typically the indirect effects), and site-specific impacts which are typically the direct effects (detailed by woodland).

The impacts below are assessed prior to mitigation.

General impacts affecting all woodlands within the licence area

Indirect impacts to bats arising from disturbance from felling activities will be fairly short-term in nature and relatively localised. Disturbance will comprise noise, dust, and some limited lighting. No night time vegetation clearance work is proposed during the active bat season. No tree felling will be done in darkness. Where other clearance work is undertaken during the darker winter months, all lighting will be limited to 1-2 hours after dusk and prior to dawn, and flood lights will be angled away from tree line/woodland edges. The noise (chainsaws and other machinery) resulting from felling of trees will be in daylight hours may indirectly affect other roost sites. Such noise will be relatively short term in nature and undertaken in conjunction with other ecologically supervised works associated with PRF inspections. Unnecessary noise by contractors will be managed through toolbox talks and direct supervision by qualified ecologists approved by the named ecologist for the Mitigation Licence.

Site-specific Impacts

The proposed clearance works will directly affect approximately 11.9 ha of woodland (18% of the total woodland within the area) within the entire licence area. Prior to mitigation, overall this is considered **a major adverse impact at the District level**.

48.55 ha of woodland (78%) within the licence area is not affected at all (directly or indirectly) by the clearance works, and other woodlands and foraging habitat occur within the vicinity outside the licence area but in connectivity with the licence area. Therefore, the ability of breeding populations of bats roosting outside the licence area to rear their young are not anticipated to be significantly impacted by the loss of foraging habitat. Impacts to the specific woodland sites within the licence area are given below.

		Impact Zones

Kenilworth - woodlands within the licence area	Area of Woodland (ha)	Woodland Directly impacted	Woodland Indirectly impacted	Area not impacted	Percentage area of habitat lost
Little Poors	1.41	0.15	0.47	0.79	10.6
Black Waste	12.82	2.05	0.33	10.44	16.0
Broadwells Wood	17.32	4.30	2.86	10.16	24.8
Roughknowles	5.07	0.41	1.01	3.65	8.1
Birches Wood	0.62	0.62	0.00	0.00	100.0
Crackley Wood	21.67	0.97	0.49	20.21	4.5
Big Poors	3.26	0.00	0.18	3.08	0.0
Other small unnamed portions of woodland	4.02	3.39	0.40	0.23	84.3
Total	**66.19**	**11.89**	**5.74**	**48.55**	**18.0%**

Broadwells Wood

- The permanent loss of 4.3 ha of woodland (24.8% of the total), comprising 1.5 ha of ancient semi-natural and 0.5 ha of replanted ancient woodland.
- A hedgerow to the south of Broadwells Wood (STN073), will be largely removed by the excavation of a cutting for the Proposed Scheme.
- Bisection of the existing Broadwells Wood via the proposed scheme.

Black Waste Wood

- Construction of a new culvert to carry an unnamed stream below the route in Black Waste Wood.
- The permanent loss of 2.15 ha of woodland (16% of the total) and severance of Black Waste Wood from woodland and scrub along the Kenilworth Greenway and from the woodland and scrub on the opposite side of the Kenilworth Greenway.

Little Poors Wood

- The permanent loss of 0.15 ha of woodland (10.6%) to allow construction of an access track along its edges.

Rough Knowles Wood

- The permanent loss of 0.41 ha of woodland (8.1%) to allow construction of an access track along its edges.

Birches Wood

- The permanent loss of the entire woodland (0.62 ha) (100%) connecting to Rough Knowles Wood, to make way for the main route of the Scheme.

The clearance works that will create the above impacts will not all occur at once but in a staged manner. The staging as it is currently understood is set out in Appendix A and shown in Figure Db.

Consideration of construction impacts beyond vegetation clearance

Other impacts will occur later once construction of the Scheme commences (excavation of cuttings and tunnels, building of viaducts and bridges, construction of embankments, installation of the track and relevant infrastructure etc). The construction phase is expected to last approximately five to seven years although works at individual locations will be of much shorter duration during this time period. Disturbance from the construction works in the absence of mitigation will comprise mainly noise, vibration and possibly lighting, and will affect approximately 5.74 ha of woodland retained outside the works area but falling within the 20m indirect impact zone. These impacts are dealt with outside this licence application at the Detailed Design stage through Schedule 17 applications (see B2.1) to relevant planning authorities which are informed by the Environmental Minimum Requirements (EMR) documents published by HS2 and with reference to the HS2 Code of Construction Practice (CoCP). In the Written Statement for the Sch 17 application, the final detailed design is set out. The changes to design since the ES are detailed and all potential impacts are reassessed. Mitigation measures are also reviewed and amended if required. Although the exact location and detail of impactful works cannot be known as the detailed assessment has not been undertaken, it is considered that in the absence of mitigation, under a worst case scenario the potential indirect construction impacts may represent a **moderate to major adverse effect, that may be significant at up to the District level**.

Confirm number of roosts to be damaged:

N/A – All roost damage is considered a loss and is detailed in the Roost Loss section below. Given the highly transient nature of bat populations that use trees, the roosts identified by the ALBST surveys are those which were confirmed as in use by bats at the time of the survey. The bats within Birches Wood, Rough Knowles Wood, Broadwells Wood and Black Waste Wood are likely to use significantly more tree PRFs within the same woodland habitat than just those roosts listed in this application. Therefore, the potential roosts detailed above may also support the same populations detailed below and have been fully factored into the overall assessment of the Scheme's predicted impact and residual effects on the bat populations relevant to the whole woodland.

D2 Long-term impacts: Consider and explain the impacts of the proposed works on the different species populations at a site, local, regional, and national level**.**

D2.1. Roost modification: e.g. changes to roosts/access points, new entrances (including human access e.g. for servicing/maintenance etc), change in size of roost space, changes in air flow, temperature and humidity, light etc. Please detail the access points into each roost and the type/s of roosts which will be modified.
E.g. Non-mitigated changes to the roof structure, which requires replacing, will lead to the modification of 3 access points into a common pipistrelle maternity roost which will result in bats being unable to enter or exit the roost. Moderate negative impact on a local level.

Confirm number of roosts to be modified:

Indirect impacts/alteration to conditions due to nearby woodland clearance for the following roosts:

Bat Species	Conservation Status	Physical Type	Roost Name	X	Y	Ecology Type
M. nattereri	High	Tree	239439d	[redacted]	[redacted]	Maternity
M. nattereri	High	Tree	696a	[redacted]	[redacted]	Maternity
M. nattereri	Low	Tree	777a	[redacted]	[redacted]	Day (Summer)
M. nattereri	Low	Tree	816b	[redacted]	[redacted]	Day (Summer)
P. auritus	High	Tree	238353b	[redacted]	[redacted]	Maternity
P. auritus	High	Tree	240266a	[redacted]	[redacted]	Maternity
P. auritus	Low	Tree	239433b	[redacted]	[redacted]	Day (Summer)

- Two day and two maternity roosts for Natterer's bat which represents a **moderate adverse impact at the local level**.
- Two maternity roosts and one day roost for brown long-eared bat which represents a **moderate adverse impact at the local level.**
- Alteration of conditions (comprising disturbance or alteration of ambient conditions such as light, noise, exposure or airflow) affecting approximately 410 trees with PRFs (low, moderate and high) to support roosting bats, which would be a **moderate adverse impact at the District level** due to the presence of maternity populations of two species and potentially another nine species that may use these roost sites.

D2.2. Roost loss: Loss or deterioration of roosting sites, access points, habitat, etc must be considered. Please detail the access points into each roost and types of roost/s which will be lost.
E.g. Demolition of building reference X in June will lead to the loss of a night roost in the porch used by 1 lesser horseshoe bat and the loss of a maternity brown-long eared bat roost in the loft space. This will lead to the death and/or injury of bats including dependent young and permanent destruction (loss) of both roosts. Moderate negative impact at a site level for lesser horseshoe bats and moderate negative impact at a local level for brown-long eared bats.

Confirm number of roosts to be destroyed:

Ten roosts would be destroyed as a result of vegetation clearance within the woodlands. The loss of these roosts, including maternity roosts, is considered a **major adverse impact for brown long-eared and Natterer's bat at the local level,** and **a moderate adverse effect at the site level for common and soprano pipistrelle.**

Bat Species	Conservation Status	Physical Type	Roost Name	X	Y	Ecology Type
M. nattereri	Low	Tree	237061b	[redacted]	[redacted]	Day (Summer)
M. nattereri	Low	Tree	239451a	[redacted]	[redacted]	Day (Summer)

M. nattereri	Low	Tree	237061c	[redacted]	[redacted]	Day (Summer)
P. auritus	High	Tree	239055c	[redacted]	[redacted]	Maternity
P. auritus	High	Tree	238353a	[redacted]	[redacted]	Maternity
P. auritus	High	Tree	238336a	[redacted]	[redacted]	Maternity
P. auritus	High	Tree	239055a	[redacted]	[redacted]	Maternity
P. auritus	High	Tree	289a	[redacted]	[redacted]	Likely maternity
P. pipistrellus	Unknown	Tree	KS-F001	[redacted]	[redacted]	Unknown
P. pygmaeus	Unknown	Tree	KS-F002	[redacted]	[redacted]	Unknown

It is important to note that the confirmed roosts to be destroyed are likely to under-represent the level of roost use by the bat population at the Kenilworth sites, due to the fission/fusion nature of tree roosting bats. The entire woodland area is considered to be the 'breeding site' (as defined by the Habitats Regulations) and other trees within and outside the impact area within the woodland are likely to be used as roosts, but not recorded due to the limitations of the sampling approach.

The Scheme will also destroy trees with PRFs (approximately 800 low 584 moderate and 107 high potential to support roosting bats) which should be regarded as an integral part of the roost resource represented by the woodland as a whole. This is a **major adverse impact at the District level**.

[See Figure Da – Impacts/Fragmentation Plan]

[See Figure Db – Impacted Trees with Roosting Potential Plan]

D2.3. Fragmentation and isolation: Will the proposed works results in these impacts? E.g. loss of linear features such as hedges, tree lines, increased lighting, severance of flight lines by roads/rail lines, separation of breeding/hibernation sites from feeding grounds, etc.
E.g. In addition to the removal of common pipistrelle day roosts in trees along the proposed road, removal of hedgerows, shown on Figure D, and the construction of the new road will fragment a significant commuting and foraging route for a lesser horseshoe maternity roost. This may cause a reduction in the long term success of the breeding colony of lesser horseshoes by restricting existing foraging range or killing bats on the road. Potentially major negative impact at a site and local level.

In the absence of mitigation, fragmentation of bat commuting routes through the Kenilworth sites licence area from the construction of the Scheme would represent a **moderate adverse impact at up to the District level**.

Kenilworth - woodlands within the licence area	Area of Woodland (ha)	Impact Zones		
		Woodland Directly impacted	Woodland Indirectly impacted	Area not impacted
Little Poors	1.41	0.15	0.47	0.79
Black Waste	12.82	2.05	0.33	10.44
Broadwells Wood	17.32	4.30	2.86	10.16
Roughknowles	5.07	0.41	1.01	3.65
Birches Wood	0.62	0.62	0.00	0.00
Crackley Wood	21.67	0.97	0.49	20.21
Big Poors	3.26	0.00	0.18	3.08
Other small unnamed portions of woodland	4.02	3.39	0.40	0.23
Total	**66.19**	**11.89**	**5.74**	**48.55**

Predicted fragmentation and isolation impacts prior to any mitigation for each woodland are as follows:

Birches Wood – None predicted as the whole woodland is to be lost.

Rough Knowles Wood - Fragmentation impacts are not anticipated in the woodland itself as the LLAU affects only woodland edge, however the scheme will sever woodland linkages to Crackley Wood to the south.

Broadwells Wood - Fragmentation impacts are anticipated with the route running through the centre of the southern part of this woodland, leaving an area west of the route severed from the main body of woodland.

Black Waste Wood - Fragmentation impacts are not anticipated. Only woodland from the edge of the wood will be cleared, and connectivity to the wider area will be retained due to the creation of the Burton Green tunnel.

Little Poors Wood - Fragmentation impacts are not anticipated. Only woodland from the edge of the wood will be cleared, and connectivity to the wider area will be retained due to the creation of the Burton Green tunnel.

The location of Burton Green tunnel is shown below (grey dotted section of the black rail route). It is understood this will be constructed by clearing woodland and vegetation and then digging down in a cutting to create the tunnel. The tunnel will then be covered over with soil and replanting the top to create a green tunnel.

[See Figure Da – Impacts/Fragmentation Plan]

[See Figure Db – Impacted Trees with Roosting Potential Plan]

D3 Post-development interference impacts: e.g. extra street lighting or other external lighting, use of loft space as storage, increased noise. Please also consider other direct or indirect post development impacts which may include disturbance/ injuring/killing.
E.g. Security lighting being installed will shine on the brown-long eared bat maternity roost access points which may affect emergence patterns and lead to a reduction in foraging times. This may cause a reduction in the long term success of the breeding colony or cause the roost to be abandoned. Moderate to high negative impact at a site and local level.

Anticipated post-development (operational) impacts of the Scheme on bats relate to bats using or crossing the rail corridor and subsequent mortality due to collision with trains. These are anticipated to persist for the operational phase of the Scheme and as such are considered to be effectively permanent. Operational impacts will be reassessed at the Detailed Design stage within a Written Statement (see Section D1 for further details).

Predicted impacts comprise noise and vibration (disturbance) for the operational hours and days of the railway line. Trains are anticipated to take approximately four seconds to pass any one point, with 14 trains per hour at peak travel times during the day and with approximately 75 trains per day (with a reduced frequency and limited operating hours at night). During the active bat flight season (April to October inclusive), direct mortality of individual bats through collision with trains is also a potential impact (where not mitigated by embedded design such as tunnels or cuttings) between the hours of dusk and dawn.

The only anticipated night-time lighting impacts of the Scheme are those associated with the passing trains themselves, and as such are intermittent, low-level and short-duration, further reducing the likelihood of impacts associated with the passing of trains.

Impacts to bats from collision risk within the licence area are avoided through the Burton Green green tunnel (which was designed into the Scheme to avoid a permanent severance effect on the woodlands and on bats). Collision risk is also reduced with significantly raised embankments to either side of the Scheme through much of this licence area (designed to screen the surrounds from visual and noise impacts but will also lift the flight path of bats up over the route away from trains). Due to the very low chance of collision, this is not considered to represent a significant negative effect on the conservation status of bats within the Kenilworth sites.

In the event that monitoring (prescribed in Section E4.2b) identifies an impact on the favourable conservation status (FCS) of bats within the licence area at the pre-operational stage, further monitoring will be designed and implemented to determine what is causing the impacts, including consideration of collision and severance impacts.

D4 Predicted scale of impact of this development/activity on species status (also see section 6.5 of the Bat Mitigation Guidelines and the BCT's Bat Survey Good Practice Guidelines): Please complete the following table to explain what this is likely to be at the site, local/county and regional levels for each roost type and species. Add additional lines when necessary

Roost types to be referenced as: Day, Night, Feeding Perch, Transitional, Satellite, Maternity, Hibernation confirmed, Foraging Area, Commuting Route, Swarming Site, Other.

Species and Numbers (which will be affected at the time works will be undertaken)	**Roost type**	**Predicted scale of impact** ***(place X in relevant column)***			**Notes** (include impact on roost – damage / destruction /modification etc)
		Site	**Local / Parish / District / County**	**Regional**	
P. auritus	High / maternity/ unknown		x		5 roosts destroyed, 2 roosts indirectly affected
P. auritus	Low	x			1 roost indirectly affected
M. nattereri	High / maternity /unknown		x		2 roosts indirectly affected
M. nattereri	Low		x		3 roosts destroyed, 2 roosts indirectly affected
P. pipistrellus	Moderate, High or Unknown	x			1 roost directly affected
P. pygmaeus	Moderate, High or Unknown	x			1 roost directly affected

* ****Please note*** *that you can add more rows to the table: right click in any cell outside the grey box area. Choose Insert > Insert rows below.*

Provide further comments/explanation as required (this helps understand how the impacts will be mitigated or compensated for when assessing section E):

As per Bat Mitigation Guidelines, for the purposes of impact assessment and mitigation design, all roosts containing subadult bats of any sex (where in a roost with at least one other bat), or pregnant, lactating or post-lactating female bats (with no evidence to the contrary such as those proven to share a roost with other subadults or females through radio tracking) were assumed to be from a unique maternity roost within the woodland, regardless of whether they were tagged and/or tracked back to a roost.

This is to ensure no underestimation of potential impacts and subsequent residual effects takes place and ensures adequate mitigation plans based on a worst-case scenario.

Important Advice:
Please ensure that a separate 'Impact map' is provided (Figure D) which must show all structures or habitats (clearly referenced) that will be disturbed, damaged or destroyed, detailing where the roosts and access points are etc. Also *see section I "Map checklist" at the end of this document*.

E Mitigation and Compensation (please also see section 7 and 8 of the Bat Mitigation Guidelines)

E1 Please explain why this design was chosen over other potential solutions - set out what other designs were considered and why they were not feasible (*e.g. if the proposal is to construct a new stand-alone roost, explain why it is not possible to retain the roost in the existing structure etc).* The mitigation solution being proposed in the method statement should be the one that delivers the 'need' with the least impact on the bat population.

As a result of the historical lack of access to the Kenilworth sites for bat surveys to support the HS2 Environmental Statement, it is considered appropriate to adapt plans to replace roosts based on the species, numbers and nature of the roosts found within the woodland, taking account of recorded activity levels and other data obtained during bat trapping, radio tracking and emergence surveys undertaken in 2018 and 2019. This will ensure the most recent and accurate baseline data is used to inform mitigation. The layout of the route has been refined to minimise impacts on ASNW habitats and bat roosts therein, but the scheme design still impacts approximately 17.9 ha of ASNW habitat in spite of design measures to minimise those impacts (such as the Burton Green tunnel, use of existing access roads etc). Therefore, the following roost replacement, cutting, connectivity and habitat replacement measures were selected as the best option for mitigating impacts on bats and the habitats and resources that they are dependent on within the area of the Kenilworth sites.

The Early Works mitigation sites have already been through Detailed Design, with ESMPs drafted to detail the habitat creation and management of these sites. The design was informed by the impact assessment from the ES and designed to be appropriate to ecological receptors and environmental impacts within the immediate area while taking into account the mitigation provision across the wider area. Therefore some mitigation sites are targeted at great crested newts and reptiles, with only incidental benefits for bats, while others are designed to mitigate for impacts to ancient woodland, or for bats. Some sites are simply to be managed to enhance their biodiversity value (e.g. by removal of invasive species). Other areas of planting which will be planted at a later stage of works (e.g. embankments, the tops of green tunnels) fall under the Main Works and have not yet been fully designed. Where this licence applications has identified specific impacts to bats, the mitigation sites that have already been designed (EWC sites) and the future indicative areas available for planting (for Main Works sites) has been assessed and considered for its overall benefits to bats. If it is felt that additional specific benefits to bats may be achieved without compromising the planting or mitigation site's intention and benefits for other species, such design amendments have been prescribed in this licence application, and will be added to the ESMPs. Where it is felt that it is not possible to amend the planting or that recommended changes cannot be guaranteed to be implemented, no prescriptions or amendments have been recommended. The existing mitigation sites (where intended for other species or other habitat benefits) are already extremely well designed for their purpose and are ecologically sound, and to enhance them further to benefit bats has not always been possible, Where ancient woodland soils are to be translocated to preserve the seedbed and allow future ancient woodland to develop, no amendments to planting can be made without compromising the end result of the translocation. The recommendations below are considered to fit well with the other goals for mitigation sites, and to provide clear net benefits for bats – effectively these enhance a site that is already beneficial to bats still further, to make it clear that impacts to bats identified in this licence application are addressed.

The mitigation measures detailed below will be implemented alongside those committed to in the HS2 Phase 1 Environmental Statement, the HS2 Code of Construction Practice (CoCP), and the relevant Landscape & Environmental Management Plan (LEMP). Collectively, these measures will ensure impacts on the assemblage of bats at the Kenilworth sites will be reduced to the lowest level practicable whilst progressing construction and operation of the Scheme.

[See Figures E3A Roost Mitigation Features and E3B Mitigation Planting and E4 Monitoring]

E2.2 Capture and release (if applicable):

Please confirm that you agree to undertake the following procedures for the capture and exclusion of bats, where these are applicable:

a. The use of endoscopes, artificial light from torches, destructive search by soft demolition (see Definitions), temporary obstruction of roost access, temporary or permanent exclusion methods (including installation) and use of static hand held nets must only be undertaken or directly supervised by the Named Ecologist, or an Accredited Agent.

b. Where capture and/or handling of bats are necessary, only the Named Ecologist, Accredited Agent, or an Assistant directly supervised by the Named Ecologist may do so. Capture/handling/exclusion of bats must only be undertaken in conditions suitable for bats to be active.

c. Where bats are discovered and taken (excluding unexpected discoveries during adverse weather conditions) they must either be relocated to an alternative roost (see Definitions) suitable for the species, or where bats are held this must be done safely and bats released on site at dusk in, or adjacent to, suitable foraging/ commuting habitat in safe areas within or directly adjacent to the pre-works habitat.

d. Endoscopes and hand held nets are only to be used to assist with the locating and capture of bats.

e. Temporary and permanent exclusion must be carried out using techniques specified in the most up to date edition of the '*Bat Workers Manual*'. If one-way exclusion devices are to be used, each device must remain in position for a period of at least 5 consecutive days/ nights throughout a spell of suitable weather conditions, or remain longer until these conditions prevail.

f. Prior to destructive works, an inspection using torches and/or an endoscope must be performed internally to search for the presence of bats. If any licensed vesper bat species is found and is accessible, each will be captured by gloved hand or hand-held net, given a health check and then each placed carefully inside a draw-string, calico cloth holding bag or similar for transport. If any licensed horseshoe bat species is found, the capture methods outlined in (h) will only be used after it has been shown that overnight dispersal or exclusion are no longer practicable methods.

g. Following inspection and exclusion operations, the removal of any feature with bat roost potential, will be only performed by hand in suitable weather conditions and under direct ecological supervision. Where applicable, materials will be removed carefully away and not rolled or sprung to avoid potential harm to bats. The undersides of materials will be checked by the Named Ecologist or Accredited Agent for bats that may be clung to them before removal.

h. For sites where the presence of horseshoe species has been confirmed, the following exclusion method will be used: prior to work commencing, the Named Ecologist or Accredited Agent will conduct a thorough internal inspection for the presence of horseshoe bats. Only after the void is shown to be unoccupied will the destructive search commence, or all apertures into that void be closed and sealed (windows, doors, etc) by use of boarding, sealed tarpaulin or similar.

   If a horseshoe bat is encountered, it will be left undisturbed during daylight. After all bats have dispersed overnight, the void will be sealed as described above. If all bats have not emerged, the Named Ecologist will either use torchlight and non-tactile human presence to disturb the bat to encourage it to emerge and disperse, during night only, or through use of a hand held net. Only after all bats have emerged from the building or void will it be sealed.

Yes, I agree / No, I don't agree
Yes

If NO, please provide justification below. Please use this text box to describe any additional information on protocols to be employed if bats are found during works. Non-standard capture and exclusion apparatus must be shown on **Figure E2**.

Please see attached Appendix A Indicative Programme and Appendix B felling decision tree.

Additional conditions / protocols

The indicative timing of planned works is provided within Appendix A and within the Works Schedule. Works are scheduled outside the maternity season in those woodlands where maternity roosts have been found. No maternity roosts were found in Big Poors, Little Poors and Black Waste after two years of survey works. Given the scale of works required for the development of the Scheme, a pragmatic approach has been taken and therefore clearance works will occur in these woodlands during the maternity season. This ensures works can be completed within the correct season for woodlands where maternity roosts have been identified.

All bat related tree works will be undertaken by the Named Ecologist and / or the 'accredited agents'. Accredited agents will be suitably experienced ecologists with Natural England Level 2 Class (CL18) licences who have been approved by and will be working under the direction of the Named Ecologist.

All activities will be supervised by an Ecological Clerk of Works (hereafter the ECoW Site Supervisor) approved by the Named Ecologist, and all works, actions and bats encountered will be fully documented

A pre-fell decision tree has been developed (as shown in Appendix B) to ensure consistency in decisions made by accredited agents and the Named Ecologist. Guidance with examples on suitable one-way exclusion devices is provided in Appendix C in addition to guidance detailed in the Bat Workers Manual (see section 'E2.2 e' above).

Re-grading of the potential of trees (high / moderate / low) to support bats will be undertaken at the discretion of the accredited agents or the Named Ecologist. The loss of obscuring vegetation in winter allows for a clearer assessment of trees and Potential Roost Features (PRFs) from the ground in early spring. Any re-survey via ground-based inspection (BT1) or tree climbing inspection (BT2) will be documented and reported to Natural England as part of a preliminary/interim licence return. The following protocol therefore applies to all trees subject to felling that are considered by the accredited agents or Named Ecologist to have PRFs suitable to support roosting bats.

All trees declared clear of bats and approved for felling by the accredited agents or Named Ecologist will be marked and recorded.

Additional non-standard protocols not covered by Natural England conditions a-h:

1. **For trees that are safe to climb and with Potential Roost Features (PRFs) that can be reached / accessed**, pre-felling climbing inspections will be undertaken on the same day as the planned tree felling. All climbing surveys will be undertaken by accredited agents equipped with an endoscope (with 1m minimum length cable);
2. **Where a PRF contains bats,** they will be removed in line with Natural England capture and release procedures (see sections a-h above). The tree roost will be declared clear for felling by the Named Ecologist or accredited agent. Felling will take place on the same day as the climbing inspection or the roost will be made permanently unsuitable for bats, via destruction, soft felling or exclusion of bats. The action undertaken will be recorded.
3. **Where a PRF contains no bats,** the tree will be felled following confirmation by an accredited agent or the Named Ecologist that no bats are present. Should there be delays to felling, the PRF will be made unusable for roosting bats via removal of the PRF (destruction, soft felling or exclusion of bats). <u>In the event that exclusion of bats is not possible or is reported to be ineffective the PRF will be re-inspected prior to felling.</u>
4. **Where bats within a roost cannot be captured or excluded using one-way exclusion devices** consideration will be given to the range of options available to the Named Ecologist or accredited agents to establish whether bats are present or absent and how best to fell the tree. The options include undertaking additional emergence / re-entry surveys, repeat climbing inspections, or soft felling as detailed in point 6 below. A decision on the approach to be taken will be based on the nature of the PRF, associated safety considerations, the anticipated effectiveness of emergence / re-entry surveys given the time of year, and the ability to soft-fell safely.

   Where emergence / re-entry surveys are undertaken, these will make use of thermal imaging (TI) or Infra-Red (IR) cameras in-line with BCT Guidelines (Collins, 2016).
5. **Where a tree cannot be climbed or inspected due to safety** the considerations and measures outlined in point 4 above will be followed.
6. **Where soft felling is required as the presence of bats within a PRF cannot be determined,** the feature will be soft felled in conjunction with an experienced arborist. This will PRF sections to be cut away and lowered to the ground (anchored from MEWP or adjacent trees) and inspected by an accredited ecologist or the Named Ecologist. Any bats found will be moved in line with Natural England capture and release procedures (see sections a-h above) with consideration given to anchoring the section felled PRF into a nearby suitable tree. PRFs will be left in-situ on the ground within a 10m exclusion zone for 24 hours; and,
7. **Following successful bat capture** by an accredited agent or the Named Ecologist, a health check of the bat will be undertaken (see NE capture and release procedures a-h above). The bat will then either be transported immediately to a pre-installed bat box / roost mitigation feature in the same woodland parcel where access is possible, or kept in a suitable container until dusk and released near the site of capture. Bats kept in captivity and released at dusk will be cared for in line with the Bat Care Guidelines (Miller 2016).

8. All licensable works, bats captured and subsequent actions will be recorded and documented by the accredited agents approved by the Named Ecologist.

Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London

Miller, H. (ed.) (2016) Bat Care Guidelines (2nd edn). The Bat Conservation Trust, London.

Should your proposals include capture (taking) please specify numbers of each species that will be affected at the time the works are to be undertaken:

Table E2.2 Expected number of bats to be captured at the time works will be undertaken

Species	**Expected number of bats to be captured at the time works will be undertaken**. *Note: this may be different to the number of bats using the roost at its optimum time as timings for works will be at a time when bats are least likely to be present*.
Barbastella barbastellus	**5** – during rescue inspections / soft fell
Pipistrellus pipistrellus	**10** – during rescue inspections / soft fell
Pipistrellus pygmaeus	**15** – during rescue inspections / soft fell
Nyctalus noctula	**5** – during rescue inspections / soft fell
Nyctalus leisleri	**10** – during rescue inspections / soft fell
Plecotus auritus	**25** – during rescue inspections / soft fell
Myotis nattereri	**20** – during rescue inspections / soft fell
Myotis daubentonii	**5** – during rescue inspections / soft fell
Myotis mystacinus	**10** – during rescue inspections / soft fell
Myotis brandtii	**5** – during rescue inspections / soft fell
The captured bat numbers provided above are an educated estimate based on the results of the desk study, ALBST surveys, the time of year for the planned works (autumn / spring) and the broad proportions of bats found utilising the licence area. Although no specific data has been found to support the inclusion of barbastelle on the species list required to be licensed, it is considered that the habitat provides suitable roosting opportunities and the site lies within 7.5 km of South Cubbington, which is known to support regular barbastelle bats. Barbastelle bats regularly travel on a nightly basis over 15km. It is highly unlikely that barbastelles utilise the Kenilworth sites for anything more than day roosting, and as a result only very low numbers of barbastelle are likely to be encountered.	

** * Please note that you can add more rows to the table: right click in any cell outside the grey box area. Choose Insert > Insert rows below.*

E3 Bat roost and access point retention, modification and creation: Please detail how all impacts to each species (as identified in sections C and D) will be mitigated. If not applicable to your proposals please state 'N/A' in the relevant text boxes.

Please note that breathable roofing membranes must not be installed into a roof used by bats. If the use of roof membranes is necessary, only Bitumen type 1F felt with a hessian matrix will be permitted under licence:

N/A

E3.1 Retention of existing roost(s) – *Works may include, for example, maintenance works that result in no material changes to the roost but may cause disturbance or temporary damage e.g. t*emporary *exclusion of a roost to allow investigative and repair works to a bridge*. Provide details of all works including:

- Number and description of roosts to be retained, with an explanation of how they will be retained. Confirm dimensions to be retained.

Retained roosts within trees are detailed in the table below. These 43 roosts are retained by virtue of being greater than 20m distant from the direct impact zone, either within or outside the licence area. No other measures are considered to be required to retain these roosts.

Bat Species	Outside High	Outside Low	Unlicensed High	Unlicensed Low	Total
M. mystacinus	0	0	0	1	1
M. nattereri	1	15	0	3	19
N. leisleri	2	0	2	0	4
P. auritus	12	3	0	0	15
P. pipistrellus	0	0	1	1	2
P. pygmaeus	0	2	0	0	2
Total					**43**

Outside = outside impact area, within licence area

Unlicensed = outside licence area

High / Low = conservation status of roost

- Number of access/entrance points to be retained and how this will be achieved. If enhancements to the roosts will be provided, such as through crevice provision, please detail.

N/A

- Mitigation for any other impacts e.g. new lighting at the site.

There will be no new lighting at the site post-construction. No night time vegetation clearance work is proposed during the active bat season. No tree felling will be done in darkness. Where other clearance work is undertaken during the darker winter months, all lighting will be limited to 1-2 hours after dusk and prior to dawn, and flood lights will be angled away from tree line/woodland edges.

The noise (chainsaws and other machinery) resulting from clearance/felling of trees will be in daylight hours and may indirectly affect other roost sites in woodlands of the Kenilworth sites. Such noise will be relatively short term in nature and undertaken in conjunction with other ecologically supervised works associated with PRF inspections. Unnecessary noise by contractors will be managed through toolbox talks and direct supervision by qualified ecologists approved by the Named Ecologist for the Mitigation Licence.

E3.2 Modification of existing roost(s) - *Works may include, for example, reduction in roof void height, change of tiles and roof lining (stating the type of membrane that will be used), alteration of access point through replacement of soffits etc.* Please provide the following:

- Dimension details of modified roosts: clearly state what the original roost dimensions were and what the dimensions of the modified roost will be.

N/A

- Dimension details of modified access points: clearly state how the access points are being modified.

N/A

- Details of any other modifications to be made to roosts.

NA

- Mitigation for any impacts of lighting on the modified roost/s if appropriate.

The main mitigation approach is to ensure that such roosts are well marked to avoid accidental damage. There are expected to be no lighting impacts.

E3.3 New roost creation (including bat houses, cotes and bat boxes etc).

Note – creation of compensation for high impact cases (e.g. loss of a maternity roost) must be protected in the long term. Any bat boxes or roost structures that are part of a licence proposal which do not show signs of bats must be retained for a minimum of 5 years from date of completion of the development/works. Typically this will be around 5 years for low conservation status roost compensation (e.g. bat boxes) and longer for other significant roosts (e.g. bat houses, lofts etc). The exact time period will be specified in any licence issued. For high conservation status roost loss, the compensation roost/s must still be protected in the long term by another means (such as a s106 agreement), which is particularly important if the structure is likely to change ownership.

E3.3a Please complete the table below for the species and roost types listed. For all other species and roost types please provide information under **E3.3b**.

Species & Roost type for which new roost creation will be provided Select 'yes' for those species impacted or 'N/A' if not applicable to this application	**New roost creation** Compensation should be in line with the *Bat Mitigation Guidelines*. Where compensation is being provided, there should be at least **one compensation feature, suitable for the species concerned, per roost and per species to be impacted**, OR If a proposal impacts more than one bat species and / or roost type then cumulative impacts must be considered when designing the compensation; this should always be in line with the species and / or roost type which will be subject to the greatest impact and ensure that the requirements of all species impacted are met.		
	Compensation Feature	**Quantity**	**Location of Compensation Feature** (as shown on Figure E3)
Common pipistrelle ☐ Yes ☒ N/A *Day roost* *Night roost* *Feeding* *Transitional/Occasional*	☐ Bat box ☐ Integrated bat box/ bat brick/ bat tube ☐ Bat tile (including ridge tile) ☐ Other (specify): ☐ None		☐ In same building ☐ In other existing building on site ☐ In new building ☐ Other (specify):
Soprano pipistrelle ☐ Yes ☒ N/A *Day roost* *Night roost* *Feeding* *Transitional/Occasional*	☐ Bat box ☐ Integrated bat box/ bat brick/ bat tube ☐ Bat tile (including ridge tile) ☐ Other (specify): ☐ None		☐ In same building ☐ In other existing building on site ☐ In new building ☐ Other (specify):
Whiskered ☐ Yes ☒ N/A *Day roost* *Night roost* *Feeding* *Transitional/Occasional*	☐ Bat box ☐ Integrated bat box/ bat brick/ bat tube ☐ Bat tile (including ridge tile) ☐ Other (specify): ☐ None		☐ In same building ☐ In other existing building on site ☐ In new building ☐ Other (specify):
Brandt's ☐ Yes ☒ N/A *Day roost* *Night roost* *Feeding*	☐ Bat box ☐ Integrated bat box/ bat brick/ bat tube ☐ Bat tile (including ridge tile) ☐ Other (specify): ☐ None		☐ In same building ☐ In other existing building on site ☐ In new building ☐ Other (specify):

Transitional/Occasional			
Daubenton's ☐ Yes ☒ N/A *Day roost* *Night roost* *Feeding* *Transitional/Occasional*	☐ Bat box ☐ Integrated bat box/ bat brick/ bat tube ☐ Bat tile (including ridge tile) ☐ Other (specify): ☐ None		☐ In same building ☐ In other existing building on site ☐ In new building ☐ Other (specify):
Natterer's ☐ Yes ☒ N/A *Day roost* *Night roost* *Feeding* *Transitional/Occasional*	☐ Bat box ☐ Integrated bat box/ bat brick/ bat tube ☐ Bat tile (including ridge tile) ☐ Other (specify): ☐ None		☐ In same building ☐ In other existing building on site ☐ In new building ☐ Other (specify):
Brown long-eared ☐ Yes ☒ N/A *Day roost* *Night roost* *Feeding* *Transitional/Occasional*	Note: boxes for this species will only be acceptable in certain circumstances, where this is justified on an ecological basis ☐ Bat box, justification ☐ Other (specify): ☐ None		☐ In same building ☐ In other existing building on site ☐ In new building ☐ Other (specify):
Serotine ☐ Yes ☒ N/A *Day roost* *Night roost* *Feeding* *Transitional/Occasional*	Note: bat boxes are not suitable for this species. Compensation should replicate, as closely as possible, the existing roost: ☐ Bat tile ☐ Bat brick ☐ Other (specify):		☐ In same building ☐ In other existing building on site ☐ In new building ☐ Other (specify):
Lesser Horseshoe ☐ Yes ☒ N/A *Day roost* *Transitional/Occasional*	A proportionate number of bat features suitable for the species. The provision of one feature, suitable for the species concerned (eg void) per roost to be impacted will be considered appropriate: Specify:		☐ In same building ☐ In other existing building on site ☐ In new building ☐ Other (specify):

E3.3b For all species and roost types not covered in the above table please provide the following:

- New roost dimension details or features (to include bat tiles/boxes as applicable).

The minimum compensation for loss of roosts and PRFs will be as follows:

E3.3b Table 1– Provision of bat roost mitigation features	
Roost feature type (existing confirmed roost or PRF)	**Minimum replacement ratio** (roost or tree lost : roost mitigation feature)
Annex 2 species (any roost type)	4:1
Maternity / hibernation roost (any species)	4:1
Non-Annex 2 species (any roost other than maternity or hibernation)	2:1
Trees with PRFs (moderate potential only)	1:2
Trees with PRFs (high potential only)	1:1

The number of roosts and potential roost features to be impacted (directly or indirectly) at the Kenilworth sites and the number of roost mitigation features required are detailed in the table below.

E3.3b Table 2 – Details of roosts and PRFs to be lost and number of replacement features required

Species	Roost conservation value	Number affected directly	Number affected indirectly	Compensation ratio	Minimum number of compensatory roost mitigation features required
M. nattereri	Low	3	2	2:1	10
M. nattereri	Moderate, High or Unknown	0	2	4:1	8
P. auritus	Low	0	1	2:1	2
P. auritus	Moderate, High or Unknown	5	2	4:1	28
P. pipistrellus	Moderate, High or Unknown	1	0	4:1	4
P. pygmaeus	Moderate, High or Unknown	1	0	4:1	4
NA	Trees with Potential Roost Features – moderate potential	584	NA	1:2 (ratio reduced as limited area within which to mitigate – to compensate for this drop, a higher biodiversity of planting and greater density of created and naturally occurring PRFs over a long timescale (5-70 years) is targeted. This is considered more beneficial than all PRF mitigation provision comprising mainly bat boxes within the first 15 years only)	292
NA	Trees with Potential Roost Features – high potential	107	NA	1:1	107
Total		701	7		**455**

The strategy for providing the minimum requirement of 455 replacement roost features for the Kenilworth sites is as follows:

Initial / short-term provision 0-15 years:

- 56 bat boxes to compensate for ALL roosts lost per the ratios in Table 1;
- 55 bat boxes comprising one bat box for every two individual bats likely to be encountered within roosts during tree felling (as per Table E2.2) (total 110 bats of ten species predicted);
- 4 additional boxes to ensure sufficient bat boxes are available as rescue boxes during tree felling.

Short / medium-term provision 5-35 years:

- 207 roost mitigation features provided through veteranisation of retained trees within Black Waste Wood (two features created per tree, on five trees per ha) in three rounds over 15 years:
    - 69 features created in Year 1 to provide more natural PRFs for bats in the short-term (assuming these come into use five years after creation and remain suitable for 5-20 years);
    - Subsequent veteranisation of retained trees in Year 7 (69 features) and again in Year 15 (69 features);

Medium / long-term provision 30-70 years:

- 176 roost mitigation features created through veteranisation of newly planted woodland (labelled 'proposed planting') in 30 years' time when trees are mature enough (based on 10 trees per hectare having 2 features created or being present already); and
- 0.3 ha of soft fruit tree planting (early senescent varieties including domestic apple, plum and cherry) on vigorous rooting stocks (M25 or similar) which will be specified and managed as per the tables included

within Appendix E. The trees will self-veteranise from 30 years old, creating features that may be used by bats until the trees degrade and rot beyond use (>70 years). Fruit trees will be planted in a band along woodland edges, to avoid overshadowing and allow the trees to fully develop veteran features. Once these fruit trees die, the woodland planting around them will develop further resulting in the correct woodland species mix at 100 years old.

Very long-term provision 70+ years:

- Maturation of broadleaf woodland planting with natural development of PRFs from 70+ years.

All roost mitigation features will be erected or created in suitable habitats within the licence area. Rescue bat boxes will be erected adjacent to the impacted area under the direct supervision of the named ecologist / accredited agents. Due to restrictions on box locations, several woodlands will have the capture and release method outlined in E2.2 point c.

Any additional confirmed roosts discovered during bat rescue procedures will be compensated by additional bat boxes or similar mitigation features as per the ratios detailed in Table 2 above. All boxes will remain in place and suitable for bats for at least 15 years.

Table 3 below details the habitat areas included as mitigation and compensation for bats including fruit tree planting, and indicates those areas of planting where trees will be veteranised. The areas are labelled on the Figures E3A Roost Mitigation Features and E3B Mitigation Planting.

E3.3b Table 3: Habitat mitigation and areas (shown in Figure E3A and E3B)

Area Number	Description of Woodland Habitat Creation	Mitigation type	Area (ha)
1	Burton Green hedgerow	ES Planting areas	1.22
2a	Black Waste - Enhanced Mitigation Area	Bat boxes & veteranisation in existing woodland	6.74
2b	Black Waste - Remaining Area	ES Planting areas	2.52
3	Embankment planting at Burton Green	ES Planting areas	1.7
4a	Broadwells to Greenway connectivity - Enhanced Mitigation Area	Veteranisation of proposed planting	2.79
4b	Broadwells to Greenway connectivity - Remaining Area	ES Planting areas	3.62
5	Broadwells east side planting	Veteranisation of proposed planting	2.53
6a	Broadwells 1.1km long embankment - Enhanced Mitigation Areas	Veteranisation of proposed planting	0.41
6b	Broadwells 1.1km long embankment - Remaining Area	ES Planting areas	1.82
7a	Roughnowles planting - Enhanced Mitigation Area	Fruit tree planting	0.3
7b	Roughnowles planting - Enhanced Mitigation Area	Veteranisation of proposed planting	0.63
8a	Birches - Roughnowles - Crackley embankment - Enhanced Mitigation Area	Veteranisation of proposed planting	0.79
8b	Birches - Roughknowles - Crackley embankment planting - Remaining Area	ES Planting areas	0.58
9	Crackley planting (south side of route)	Veteranisation of proposed planting	2.48
Total	**All in Licence Area**		**28.14**

Where bat boxes are the selected roost mitigation feature, Table 4 below lists suitable bat box types for the different bat species and roost types identified.

E3.3b Table 4 – Suggested bat box types to mitigate for impacts to different species and roost types

Species	Type preferred	2F	1FF	2FN / 3FN	Kent	Eco Kent	Improved Crevice bat box (ICRBB)	Improved Cavity bat box (ICABB)	1FS / 1FW Maternity / hibernation
Soprano pipistrelle	Crevice	✓	✓		✓	✓	✓		✓
Common pipistrelle	Crevice	✓	✓		✓	✓	✓		

Barbastelle	Crevice		✓		✓	✓	✓		✓
Bechstein's	Cavity			✓				✓	
Natterer's	Cavity	✓		✓				✓	
Daubenton's	Cavity	✓		✓				✓	
Whiskered / Brandt's	Crevice/cavity	✓	✓			✓	✓	✓	
Brown long-eared	Cavity	✓	✓	✓				✓	✓
Noctule	Crevice/cavity	✓	✓	✓			✓	✓	✓
Leisler's	Crevice/cavity	✓	✓		✓	✓	✓	✓	

A number of manufacturers may produce bat boxes with essentially identical specifications, and these may be substituted for the listed types above.

Veteranisation of trees is explained in Bengtsson,V., Hedin, J. and Niklasson, M. 2012. Veteranisation of oak – managing trees to speed up habitat production. In 'Trees beyond the wood conference proceedings', September 2012. (See also Appendix E for further details of creation of veteran features). Veteranised features will be created using chainsaws and hand-held tools to mimic natural damage to trees, and speed up the development of rot holes, crevices, loose bark, hollows and splits on otherwise young healthy trees that would not normally develop these features until an advanced age. The removal of limbs from trees via weakening of the branch to enable the safe removal via winch or rope to create a tear out on the stem. The onsite contractor will provide a document to the licencing ecologist, identifying:

- Numbers, species and ages of trees within woodland selected for veteranisation;
- Types of features to be created with indicative sketch to show final appearance; and
- Construction methodology of features to be created.

- Access points and size of access points.

N/A

- Location details (including an 8-figure grid reference for bat houses or bat lofts relating to the structure. 8-figure grid references are <u>not</u> required for positions of individual boxes, tiles etc).

See Figure E3A Mitigation – Roost mitigation features

- Aspect. Explain how the internal conditions of the roost will be created.

N/A

- Details of the materials to be used e.g. timber, sarking, felt etc.

N/A

- Justification for any variation from the original roost and/or deviations from recommendations in the Bat Mitigation Guidelines. (*Diagrams of widely available standard bat box designs are not required; just refer to bat box name and reference number, e.g. Schwegler 1FF*).

N/A

- Mitigation for any impacts of lighting if appropriate.

N/A

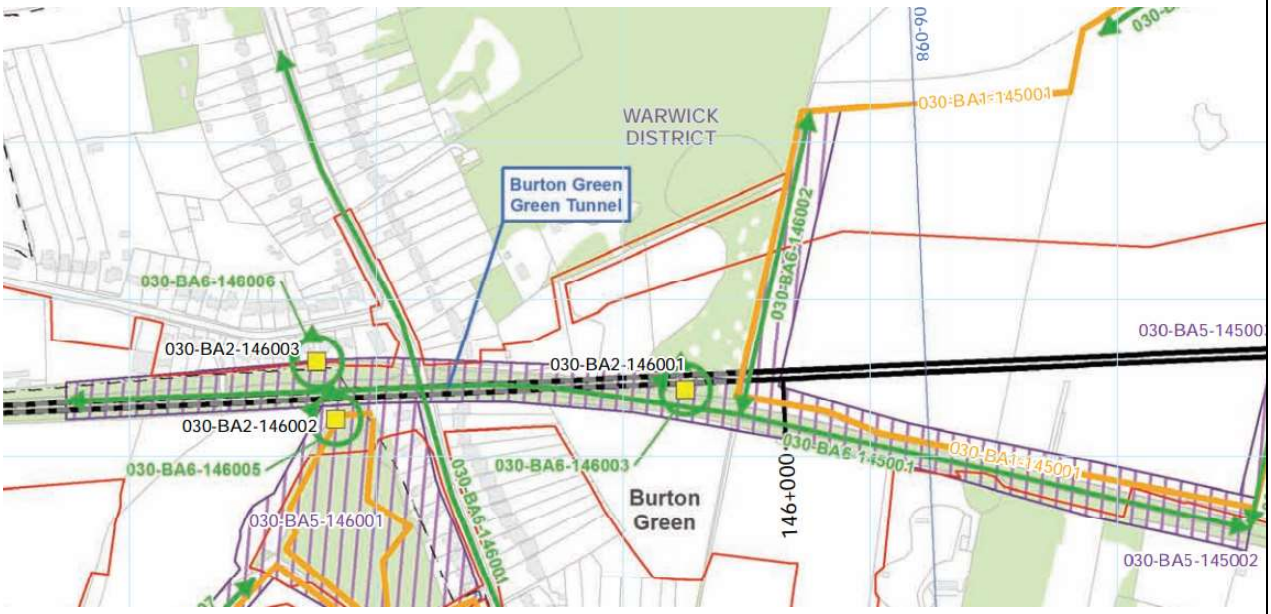
- Structures for access for monitoring / maintenance purposes (if applicable)

N/A

E3.4 Other habitat re-instatement or creation (e.g. retention of existing flight lines, retention or creation of appropriate vegetation around roost entrances where applicable) – please include details of:

- Habitat replacement (following works resulting in temporary impacts) or creation not covered by sections E2 to E3 such as hedgerow/woodland planting or enhancement. State the length of hedgerow planting and areas (ha) of other planting to be provided such as woodland and anticipated establishment period etc.

The requirement for artificial flight lines to be installed where Cromwell Lane and the Kenilworth Grreenway intersect will be assessed prior to vegetation clearance for the Burton Green tunnel, where key flight lines were identified within the ES. Vegetation clearance areas will be identified and an assessment of the potential for severance impacts to bats will be made. Temporary flight lines will be installed if required at the same time vegetation clearance occurs. See excerpt from the ES below showing the flight lines.



[See Figures E3 B Mitigation planting.

Approximately 21 ha of woodland will be created within this section of the Scheme. The target condition will be similar to that of the habitat of principal importance, lowland mixed deciduous woodland. The woodland compensation planting near Birches Wood, Rough Knowles Wood, Broadwells Wood and Black Waste Wood will extend the size of the retained woodlands. Connectivity between suitable foraging habitat at Big Poors Wood, Little Poors Wood and Black Waste Wood will be re-established through the installation of the Burton Green tunnel and enhanced through the woodland creation in this area.

Within the area, woodland edge management zones will be established to retain existing vegetation where possible and provide a more integrated transition between the Scheme and retained vegetation.

Table 1 details the areas of habitat creation and habitat management within the licence area considered to directly benefit bats. Appendix E provides details of woodland planting specification, fruit tree specification, a summary of the ESMPs relevant to these habitats at Kenilworth (comprising indicative management, target condition and other relevant factors), and a table indicating the benefits of the provided habitats for bats. A figure

showing the final habitat available to bats once the Scheme is complete (showing retained and new areas of planting as detailed below) has been provided in E3B Mitigation Planting.

E3.4 Table 1: Habitat mitigation and areas (shown in Figure E3A and E3B)			
Area Number	**Description of Woodland Habitat Creation**	**Mitigation type**	**Area (ha)**
1	Burton Green hedgerow	ES Planting areas	1.22
2a	Black Waste - Enhanced Mitigation Area	Bat boxes & veteranisation in existing woodland	6.74
2b	Black Waste - Remaining Area	ES Planting areas	2.52
3	Embankment planting at Burton Green	ES Planting areas	1.7
4a	Broadwells to Greenway connectivity - Enhanced Mitigation Area	Veteranisation of proposed planting	2.79
4b	Broadwells to Greenway connectivity - Remaining Area	ES Planting areas	3.62
5	Broadwells east side planting	Veteranisation of proposed planting	2.53
6a	Broadwells 1.1km long embankment - Enhanced Mitigation Areas	Veteranisation of proposed planting	0.41
6b	Broadwells 1.1km long embankment - Remaining Area	ES Planting areas	1.82
7a	Roughnowles planting - Enhanced Mitigation Area	Fruit tree planting	0.3
7b	Roughnowles planting - Enhanced Mitigation Area	Veteranisation of proposed planting	0.63
8a	Birches - Roughnowles - Crackley embankment - Enhanced Mitigation Area	Veteranisation of proposed planting	0.79
8b	Birches - Roughknowles - Crackley embankment planting - Remaining Area	ES Planting areas	0.58
9	Crackley planting (south side of route)	Veteranisation of proposed planting	2.48
Total	**All in Licence Area**		**28.14**

The detailed design of some of the mitigation sites including planting and the prescribed management is detailed within ESMPs (ref: 1EW04-LMJ-EV-REP-NS01_NL03-054038 for 'the Kenilworth Cluster'; 1EW04-LMJ-EV-REP-NS01-054010 for the Burton Green Cluster including Black Waste Wood) which should be read in conjunction with this Method Statement. A summary table of key details presented within the ESMPs is provided in Appendix E. There are plans showing each site at the end of the ESMP documents.

Fully developed planting details are in the ESMPs for early mitigation sites only. The ESMPs set out the management objectives of each habitat type and define performance indicators. The ESMPs also refer to Technical Standard - Landscape Maintenance, Management and Monitoring Plan (Document no.: HS2-HS2-EV-STD-000-000023). Establishment periods are informed by Paper E26: Indicative Periods for the Management and Monitoring of Habitats, and consideration of the Ecology Technical Standards (Document no.: HS2-HS2-EV-STD-000-000017) target performances is integrated into the management plan.

Further ESMPs will be developed for additional planting areas utilised for mitigation, to secure the long term management of these sites to ensure mitigation objectives are achieved.

[See Figures EC-AES-013, EC-AES-014 and EC-AES-015 which are extracted from High Speed Two Phase One: London-West Midlands Ancient Woodland Strategy dated August 2017]

[See Figures CT-06-097 and CT-06-098 – Proposed Planting Scheme from West Midlands Environmental Statement Volume 2 Map Book]

See Figure E3B and the ESMP for Kenilworth ref: 1EW04-LMJ-EV-PLN-NS01_NL03-054038

Site-specific Mitigation Measures:

Rough Knowles Wood

- An area of planting to improve connectivity between Crackley Wood and Rough Knowles Wood.
- Aligning local road diversions to reduce land required for the Proposed Scheme in ancient woodlands including Rough Knowles Wood.
- The placement of the route within cuttings will reduce the risk of bat species colliding with trains.
- An area of planned mitigation south of Rough Knowles and east of Birches Wood will be amended to include a buffer of soft fruit trees and log piles between the retained hedgerows and woodland planting (see Figure E3B Mitigation Planting). These fruit trees will naturally veteranise rapidly to create mitigated roost features.

The fruit trees will be on vigorous root stock e.g. M25, and will be half standards to ensure quick veteranisation, they will be locally sourced, native varieties local to the area or region.

Broadwells Wood

- An area of planting between the Proposed Scheme and the Kenilworth Greenway to the north of Broadwells Wood
- Woodland habitat creation targeting lowland mixed deciduous woodland in an area of 13.2 ha between Broadwells Wood and Burton Green, as well as a small area of grassland and ponds.
- The placement of the route within false embankments (designed to avoid visual and noise impacts) will reduce the risk of bat species colliding with trains.
- Maintaining connectivity between retained sections of Broadwells Wood via Footpath W186 underpass.(N.B. this underpass will be designed at the Main Works stage; design details are not available at the current moment. Assessment of the function of the underpass as mitigation for bats will be made within a Written Statement and impacts reassessed. If impacts to bats for the Kenilworth sites are identified from prescribed monitoring associated with this licence, further monitoring to determine the reasons will include assessment of the functionality of the underpass and prescribe remedial measures if required).
- Substantial areas of new planting, ecological mitigation areas and advance planting adjacent to Broadwells Wood to aid integration.

Black Waste Wood

- A 47m-long embankment approximately 2 m high with raised earthworks on both sides to provide visual and noise screening, that may reduce the risk of bats colliding with trains.
- Woodland enhancement within the retained area of Black Waste Wood comprising removal of invasive species.

- Creation of flight lines/routes of connectivity.

NA

- Foraging area enhancements, etc

N/A

- Mitigation for any impacts of lighting if appropriate.

N/A

E3.5 Wider biodiversity gains:
Please indicate if enhancements, over and above what is necessary to mitigate the impact of the activity of the licence proposal, are being provided. Please indicate if enhancements are included to satisfy the requirement of a planning permission, and if so state the relevant planning condition, or other consents in your response below. Please also state if an applicant wishes to provide more than is typically required to mitigate for the impacts. Enter N/A if this is not applicable to your application.

Note: *Any licence granted will only cover mitigation and compensation required to fulfill licensing requirements, but will acknowledge additional biodiversity enhancements*.

N/A

Important Advice:
Scaled maps/plans of mitigation/compensation must be provided as separate maps/figures (also ***see section I "Map checklist" at the end of this document)***:

- **Figure E2** if non-standard capture and exclusion apparatus is proposed please include diagrams/photographs.

- **Figure E3** to show specifications for mitigation / compensation to be provided and annotate where it will be provided. Should the scheme be large or complicated it may be necessary to submit more than one figure.

NOTE: It must be possible to compare these with the survey results plan (**Figure C6**) and 'Impacts' Figure (**D)**.

E4 Post-development site safeguard: Further guidance and explanation on post-development monitoring requirements are included within our 'How to get a licence' document http://www.naturalengland.org.uk/Images/wml-g12_tcm6-4116.pdf. Also see Section 8.7 of the Bat Mitigation Guidelines.

E4.1 Habitat/site management and maintenance: Is any specific post-development habitat management and site maintenance planned? If 'No; state 'N/A'. If 'Yes' include the following:

- The period (years and months) for which habitat management and maintenance will take place. Ensure that this is consistent with the post development works detailed in section **E5b** of the **Work Schedule document, WML-A13-a-E5a&b**.

Yes - The HS2 ES makes provision for the preparation of Local Environmental Management Plans (LEMPs) to ensure the long-term management of compensatory habitats. In the Kenilworth sites licence area this includes the establishment of woodland edge management zones around Broadwells, Black Waste, Big Poors and Little Poors Woods to enable retention of existing vegetation where possible and a more integrated transition between the Scheme and retained vegetation.

These documents have been produced and are now known as Environmental Site Management Plans (ESMP). The ESMPs relevant to the Kenilworth sites (ref: 1EW04-LMJ-EV-REP-NS01_NL03-054038 for 'the Kenilworth Cluster'; 1EW04-LMJ-EV-REP-NS01-054010 for the Burton Green Cluster including Black Waste Wood)) prescribes management and maintenance over 5 – 50 years depending on the habitat type. Maintenance is also prescribed for bat boxes but not other roost mitigation feature types. Three target age classes for woodland trees are prescribed (saplings seeds, young and mature trees, and standing or fallen deadwood of >20cm diameter) by the end of the 50 year management plan.

The ESMP makes reference to the HS2 Technical Standard - Ecological Monitoring Strategy (EcMS) (ref: HS2-HS2-EV-STR-000-000029 C01 dated October 2018) which specifies the monitoring to be undertaken for all compensatory and mitigation habitats.

- Details of what will be undertaken in terms of site maintenance required to ensure long-term security of the affected population (e.g. maintain, repair or reinstate access points; maintain and repair heaters and /or data loggers; maintain, repair or restore bat feature / bat loft in good condition; repair or replace inspection hatches; management and maintenance of lighting regime, or bat boxes etc).

Maintenance of bat boxes and replacement roosts will be undertaken as required during the course of the monitoring scheme. This maintenance is specified in the Kenilworth sites ESMPs which will be updated to reflect prescriptions within this Method Statement.

- Details of what will be undertaken in terms of habitat management (e.g. planting cover around roost structure, hedgerow management regime, checking establishment of habitat creation; reduction of shade around roosts, woodland management to maintain species and structural diversity etc). Ensure this relates to the relevant map.

Appendix E provides summary tables of relevant habitat mitigation including indicative management and target condition as taken from the Kenilworth ESMPs and as prescribed for fruit tree planting which has been designed specifically for bats for this licence application. Management of 9.26 ha of woodland will be undertaken as part of the mitigation for HS2 of which 6.74 ha of Black Waste Wood will be managed to enhance this area for bats. Works prescribed within the ESMP (1EW04-LMJ-EV-PLN-NS01-054012) are currently very basic and comprise selective thinning and rotational coppicing over 50 years to create a diverse age structure with benefits for bats and other wildlife.

The ESMPs will be updated with a more specific management regime for the retained woodland. Habitat management appropriate for this site includes coppicing, veteranisation of trees (as described in E3.3 above) and planting of native species as appropriate. It will include no felling or coppicing of trees with previously recorded bat roosts. Trees with Potential Roosting Features (PRFs) present will require a pre-fell climb by a suitably qualified and licensed ecologist prior to works on that tree. Coppicing and felling should be restricted to a maximum of 0.1ha per management year on a rotation. Nectar rich plants and dead wood should be left *in situ* to create an environment for invertebrates which in turn provides additional foraging resources for bats. This

management will be added to the ESMP and is a requirement to deliver the benefits necessary as mitigation / compensation for the identified impacts to bats. Relevant amendments to the ESMP will be signed off by the Named Ecologist.

Note – for phased or multi-plot developments a separate habitat management and maintenance plan is required, which must be submitted with the master plan: see guidance on phased developments.

Important Advice:
Please include **Figure E4** as a separate figure to show which structures and habitats will be managed, maintained and monitored post development as part of your proposal – also *see section I "Map checklist" at the end of this document)*.

E4.2 Population monitoring, roost usage etc: This should be in line with the monitoring requirements detailed in the Bat Mitigation Guidelines section 8.7 and Figure 4.

E4.2a Please complete the table below for the species and roost types listed. For all other species and roost types please provide information under E4.2b.

Species	**Roost type**	**Post-development monitoring requirement**
Common pipistrelle **Soprano pipistrelle** **Whiskered** **Brandts** **Daubenton's** **Natterer's** **Brown long-eared** **Serotine**	*Day roost* *Night roost* *Feeding* *Transitional/Occasional*	☐ None. There is no post-development requirement for proposals affecting bat roosts supporting up to any 3 species indicated, of the roost types listed, where they are used by low numbers of each species. ☐ A single presence / absence survey at an appropriate time of year is to be undertaken. This should not take place in the first year following completion of development. Timing (year): ☒ Other (specify): Bat boxes provided as mitigation for roost losses will be subject to a robust monitoring scheme to gather data on compensatory roost uptake related to the Proposed Schemeas per the EcMS. See below for details.
Serotine	*Day roost* *Night roost* *Feeding* *Transitional/Occasional*	☐ A single presence / absence survey at an appropriate time of year is to be undertaken. This should not take place in the first year following completion of development. Timing (year): ☐ Other (specify):
Lesser Horseshoe	*Day roost* *Transitional/Occasional*	☐ A single presence or absence survey at an appropriate time of year to be undertaken in year 2 post development plus a check of the condition and suitability of the roost. ☐ Other (specify):

E4.2b For all species and roost types not covered in the above table please include details of:

- Timing – state the years and months post development monitoring or other will be undertaken. Ensure that is consistent with the post development works detailed in section **E5b** of the **Work Schedule document WML-A13-a-E5a&b**.

[See Figure E4 – Monitoring Specification]

The programme of monitoring will be informed by the Main Works programme – any changes to the Main Works will be used to inform the detailed programming of the post-tree clearance monitoring.

Currently clearance works are programmed for 2020. There is then an approximately five-year construction programme. Pre-operational testing will take 18months to two years. Operation of the Scheme will then

commence and this is now targeted for 2029 or 2030 depending on amendments to the construction programme over that period.

Given the long timescales involved for construction and subsequent operation of the Scheme, and given that the vast majority of the impacts will be incurred at the initial tree clearance phase at the start of the construction phase, it is proposed to undertake the first two rounds of monitoring prior to the operational phase of the Scheme. This will cover both basic monitoring of replacement roost features, and more complex non-standard monitoring proposed (bat trapping and tracking or ALBST, see E4.3 below for details). The timing is set out in Table 1 below. Years 2 and 4 post-clearance have been proposed to align with the HS2 Ecological Monitoring Strategy (EcMS) : HS2-HS2-EV-STR-000-000029 (see Table 5b reproduced from the EcMS below which outlines the standard timings). The timing of the third round of monitoring will be scheduled to occur during operational testing, in order to capture and assess impacts from operation. Currently this is anticipated to occur in approximately 2028-2030.

A review of the monitoring strategy is proposed after the first two rounds of monitoring (in year 5 as per Table 1 below) to align with the recommendations in the EcMS. This is to incorporate any relevant changes, such as a better understanding in the use of the area by bats from the monitoring, changes to the Main Works programme, and advances in bat science and survey techniques. The techniques used and timing of subsequent rounds of monitoring may be varied as part of this review. If impacts are identified during the third monitoring round at the pre-operational testing phase, further monitoring would then be designed to determine the cause of the impacts and to inform any remedial measures if required.

E4.2b Table 1 – Timing of monitoring works (as understood in March 2020)

Tree felling = Year Zero		**Ongoing construction / Pre-operation** Post-tree felling – years 1 – 10 (+1, +2 etc) – to align with ECMS									
-1	0	1	2	3	4	5	6	7	8	9	10
2019	2020		2022	2023	2024	2025		2027			2030
Survey works completed and mitigation planned	Felling of trees occurs – erection of bat boxes and first round of veteranisation of retained trees		**First round of monitoring** and bat box checks	Reporting	**Second round of monitoring** and bat box checks	Reporting and review of monitoring strategy in consultation with NE		Second round of veteranisation of retained trees	**Third round of monitoring** during operational testing. Timing may vary due to construction delays		

Standard timing of post-development monitoring as per Table 5B of the ECMS reproduced below.

EcMS Table 5B. Monitoring frequency: bat roosts.

Objective	**Years since replacement roost installation**								
	1	2	3	4	5	6	8	10	11-15
Determine if roosts or replacement roost features are being used by bats	None		None		None			None	
Determine if conditions at replacement roosts are suitable for use by bats	None		None		None			None	
Key		All roosts or replacement roost features for which any kind of monitoring is				Complex replacement roost structures			Selected roosts to be carried

		identified by decision tree (including monitoring under Class Licences WMPL-CL39 and CL40)		where required under licence. N.B. Veteranised features considered to be complex roost features as this mitigation strategy is currently untested.		forward for long term monitoring. To be agreed with HS2 and reviewed following each monitoring year.

None = No monitoring under EcMS. The monitoring prescribed follows the route-wide bat licence that explicitly states monitoring should not occur in the first year.

- The type of monitoring which will be undertaken – include survey methods and equipment to be used. If it is expected any bats are to be taken or disturbed during this period please state anticipated numbers per species against each licensable activity.

E4.2b Post Tree Clearance Monitoring

Aims

The proposed licence monitoring at the Kenilworth sites aims to establish whether the mitigation and compensation measures implemented to address impacts on tree roosting bat species arising from tree clearance ahead of HS2 construction, are effective in maintaining the relevant bat species at favourable conservation status (FCS).

In summary, FCS relates to the long-term distribution and abundance of the populations of species in their natural range. At a local level this is best viewed as the contribution to wider FCS for the species concerned.

Currently the FCS of a species is measured and assessed with consideration given to the species' range, population size, and the condition and extent of relevant habitats, all of which inform likely future status of the populations concerned (see JNCC Joint Statement, 2018).

Baseline Data

The baseline data collected using ALBST relating to the assemblage of bats at the Kenilworth sites consists of the following:

- Capture information of free flying bats, including species, location, sex and breeding status - provides the **assemblage of bat species**;
- Radio-tracking target species (target species were tagged) provides **confirmed roost locations** and **type / feature**, even those well outside of the licenced area;
- Emergence surveys (with IR cameras) of the confirmed roosts provides **number of bats** (population estimate), **status of the roost**(s) (i.e. day/maternity/mating);
- In addition, **habitat information** such as number of PRF's, woodland type, extent (ha) and anticipated losses (ha) as a result of the scheme have also been obtained.

With the level of baseline data gained using ALBST, the distribution and abundance of the populations of species in their natural range may be robustly measured. Using the same techniques for monitoring over the long term, the FCS can be confidently assessed.

Monitoring Objectives

The monitoring approach is determined by a range of factors to ensure it is proportionate to the predicted impacts on the conservation status of the species / assemblage concerned. The monitoring approach needs to provide the best method(s) of assessing (in a qualitative way) the effectiveness of the mitigation measures employed at the relevant sites and whether the clearance works have been detrimental in the short, medium and longer term.

To assess whether the mitigation measures have been successful in maintaining FCS of the species concerned, the following questions will need to be answered:

1. For assessment of the impact on the *local occurrence/distribution* of the species concerned, has the **number / assemblage of bat species** occurring within the site* changed or been reduced, despite the implementation of mitigation?
2. For assessment of the impact on the *local occurrence/distribution* of the species concerned, has the **breeding status** of the relevant bat species occurring on the site* changed or been reduced?
3. For qualitative assessment of the impact on the *population and distribution* of the species concerned, has the **population type** (i.e. presence of maternity roosts) of key target species** changed or been reduced, despite implementation of mitigation?
4. Has the area of **compensatory habitat** developed sufficiently to provide for the species concerned in the long term?
5. To what extent have the **roost mitigation features** been used by the species concerned?

Therefore the monitoring methods utilised must provide the data necessary to answer these questions.

**The site is the woodland parcel/habitat directly and indirectly impact by tree clearance.*

*** Target bat species are those which roosted regularly / consistently at the site from which a satisfactory baseline population assessment could be undertaken – in this case brown long-eared and Natterer's bat.*

Indicative trapping locations for future monitoring are shown on Figure E4 Monitoring. These largely align with the trapping locations used to establish the baseline for this licence application, although may have been moved to accommodate habitat loss from tree clearance for the Scheme. Trapping / monitoring locations are designed to generally monitor for impacts to FSC; should any impacts be identified the monitoring will be varied in future monitoring rounds to inform an investigation into the potential reasons for the impacts.

Rationale for proposed monitoring methods at the Kenilworth sites

It has been established that the Kenilworth sites primarily support maternity roosts for Natterer's and brown long-eared bats. Monitoring will therefore be required to confirm the continued presence of these species (the 'target' bat species referred to below) and roost types in numbers comparable to those determined from baseline survey data obtained in 2018 and 2019.

It is therefore important for the monitoring approach to include methods for assessing:

- the effectiveness of the replacement roost features (such as bat box inspections); and
- the continued presence of roosts of the bat population within retained woodland areas where they may still be using other trees.

The monitoring methods proposed to achieve these objectives are a mix of traditional roost checks and ALBST surveys comprising trapping, tagging and radio-tracking. These are set out in the monitoring matrix below. This work will be undertaken by ecologists approved by the named ecologist to ensure consistency in monitoring survey methods employed pre- and post-mitigation. Thermal imaging cameras will be used to support roost characterisation where necessary.

Should monitoring be confined to roost replacement features only, there is a danger that low uptake of these mitigation features by bats could provide for a poor assessment of FCS, when in fact the tree roosting bat populations may still be adequately provided for within the retained woodland areas or, as the evidence suggests, in the surrounding residential areas and mature woodland. Therefore, the proposed combined approach not only provides data on the compensatory roost use, but can also place the mitigation roosts in context with the retained natural roosting habitat of the site as a whole.

ALBST monitoring surveys will be undertaken as part of the licence monitoring taking into consideration the following factors:

- The requirement to gain data comparable to that obtained during pre-construction surveys;
- The ability to more accurately assess FCS by gathering data relating to the use of roosts across the full extent of the habitat concerned, rather than just the mitigation features created or installed;
- The ability to deliver each of the above at comparable or lower cost than a 'traditional' monitoring approach, whilst simultaneously requiring fewer skilled ecologists (a recognised potential constraint to future monitoring activities); and
- Potential to avoid unnecessary further intervention due to greater confidence in monitoring.

Monitoring methods

The monitoring matrix below has therefore been developed to address the monitoring objectives and has taken in account the challenges associated with tree roosting bat species. It is acknowledged that there are limitations

with all methods, especially in determining the population aspects of FCS. All monitoring will be undertaken or overseen by the ecologist / accredited agents named on the mitigation licence.

The monitoring matrix outlines the FCS value the monitoring will inform, the objective and broad methodology. In addition, broad success indicators are given from which mitigation effectiveness can be assessed. Where assessed as ineffective, remedial action will be proposed.

Detailed survey methodologies for the monitoring approaches will be developed to achieve the aims of the monitoring strategy. As set out in section E4.2, a review of the monitoring strategy is proposed following the tree climbing prior to felling (to account for any additional roosts discovered during these works) and then in Year 5 following the first two rounds of monitoring, in accordance with the approach outlined in the EcMS. This is to incorporate any relevant changes, such as a better understanding in the number of roosts (that may be found during tree climbing inspections prior to felling), use of the area by bats from the monitoring, changes to the Main Works programme, and advances in bat science and survey techniques. The techniques used and timing of subsequent rounds of monitoring may be varied as part of this review and any relevant amendments to monitoring will be agreed with HS2 and Natural England.

Bat box / roost mitigation feature inspection methodology will follow that of the Bat Worker's Manual and BCT Bat survey Guidelines (Collins 2016).

Monitoring matrix

FCS value	Objective (with monitoring objective number)	Method	Timing	Location	Broad success indicators
Distribution	**Monitoring of mitigation feature uptake by bats (5)** and comparison of **species assemblage (1)** and **breeding status (2,3)** pre- and post- tree clearance works	2 x roost mitigation inspections confirming the presence of bat species and breeding status in June and September. Dropping collection for eDNA analysis to confirm species where possible	Years 2 and 4 post tree clearance (per ECMS) Review following year 4	Retained and new / planted mitigation woodland areas	Continued presence of the relevant bat species and associated breeding status post works. Confirmation of use of mitigation roost features.
	Comparison of species **assemblage (1)** and **breeding status (2)** pre and post clearance works	Trapping surveys in June, August and September	Years 2, 4 and 10 post tree clearance Review following year 4	Retained and new/planted mitigation woodland areas	Continued presence of the relevant bat species and associated breeding status post works (comparing pre-clearance works trapping data e.g. assemblage, numbers present, species and breeding status).
	Where species baseline data is sufficient, compare **roosting presence (3,5)** within same woodland parcel.	Radio tracking of target bat species to locate roosts in June, August and September. Activity surveys if no tagged bats found.	Years 2, 4 and 10 post tree clearance Review following year 4	Retained and new / planted mitigation woodland areas	Continued presence of roost types and associated species. (comparing pre-clearance works tracking data e.g. roost types, locations and numbers present).
Population	Comparison of the **population type (3)** of bat species where baseline data of target species* is sufficient for comparison.	Radio tracking of target bat species to locate roosts, followed by emergence surveys using Infra-red / Thermal Imaging devices in June, August and September.	Years 2, 4 and 10 post tree clearance Review following year 4	Retained and new/planted mitigation woodland areas	No decline or an increase in established baseline population presence and type of target bat species

Habitat	Comparison of new **habitat** creation in relation to habitat areas lost **(4)**	Assessment of woodland areas	As per EcMS	Mitigation areas only - New woodland creation / planting areas Figure E3B	Woodland creation in place and meeting creation targets
Roost Mitigation Feature	Monitoring of bat boxes confirming the **presence of bat species (1,5) and breeding status (2,3)**	2 x roost mitigation inspections in June and September. Dropping collection for eDNA analysis to confirm species where possible.	Years 2 and 4 post tree clearance as per the ECMS Review following year 4	Retained and new / planted mitigation woodland areas	The baseline assemblage of bat species recorded using bat boxes and other mitigation features.
	(if relevant) Monitoring of other roost replacement features, e.g. monoliths salvaged from woodlands and 'veteranised' retained trees. Confirms the **presence of bat species (1,5) and breeding status (2,3)**	Ground-based, inspections (and tree climbing inspections where needed / safe); recommendations for replacement as necessary; supervision of replacement. Emergence / re-entry surveys to confirm use or otherwise inform requirement for re-siting / additional features.	Years 2 and 4 post tree clearance as per the ECMS Review following year 4		

Target bat species are those which roosted consistently at the site from which a satisfactory baseline population assessment could be undertaken.

- Specify which compensation/mitigation measures will be subject to monitoring (as referenced on Figure E4).

1. Bat boxes erected to compensate for loss of confirmed roosts and loss of moderate and high potential roost features.
2. Retained woodland areas of those affected by works and enhancement areas
3. Woodland creation areas
4. Monoliths and veteranised retained living trees, and any roost mitigation features created on these trees.

Please note that it will be a requirement of the licence to undertake remedial action should monitoring identify that further management/maintenance is required of any compensation/mitigation provided, to ensure that mitigation/compensation measures are working effectively and are fit for purpose.

Important advice: Please always consider whether any *post development* monitoring effort should be staggered over alternate years in cases where use of the compensation measures may not occur in the same year of provision.

E4.3 Mechanism for ensuring safeguard of mitigation/compensation and post-development management, maintenance and monitoring works:

Please explain what mechanism is in place to ensure safeguard of mitigation/compensation provisions (e.g. Restrictive Covenant, clause to relinquish future development rights in S106 agreement, NERC Act agreement, explicit recognition of site in local planning documents, designation as County Wildlife Site or similar.) The need for this, and the type of mechanism, will vary with the scheme and impact. For substantial impact schemes (e.g. destruction of a significant maternity roost, or important hibernation site), some mechanism is always required. If you offer no specific mechanism, explain how you believe

the population will be free of threats as far as can be reasonably determined (**the expectation of the granting of a licence should not be used for this purpose**).

HS2 publishes overarching technical documents which all its contractors are contractually required to adhere to (where relevant). These documents are kept up to date and are reissued periodically.

The Environmental Site Management Plans (ESMPs) relevant to woodlands within the Kenilworth sites licence area (ref: 1EW04-LMJ-EV-REP-NS01_NL03-054038 for 'the Kenilworth Cluster'; 1EW04-LMJ-EV-REP-NS01-054010 for the Burton Green Cluster including Black Waste Wood)) prescribe management and maintenance for the mitigation and compensatory habitats and features over 5 – 50 years depending on the habitat type. The Kenilworth ESMPs will be updated as per E4.1 above.

The ESMP makes reference to the HS2 Technical Standard - Ecological Monitoring Strategy (EcMS) (ref: HS2-HS2-EV-STR-000-000029 C01 dated October 2018) which specifies the monitoring to be undertaken for all compensatory and mitigation habitats.

The EcMS (and ESMPs if required) will be amended and reissued by HS2 in line with any specific NE prescriptions related to this and other related licence applications where applicable.

The Environmental Minimum Requirements (EMR, March 2016) provided (within the Code of Construction Practice) for an independent review body to annually assess mitigation and monitoring, to ensure this meets the requirements and is fit for purpose. The independent HS2 Ecology Review Group (ERG) require annual monitoring reports. The ERG may make recommendations for remedial measures to the nominated undertaker where progress against objectives is considered not to be sufficient. Measures will be put in place to ensure that, in cases where the ecological objectives are not being realised, this can be dealt with in an appropriate manner. The ESMP states that the nominated undertaker (i.e. the licence holder or LMjv) will maintain or make provision to maintain and monitor any new or managed habitat for a sufficient period to ensure that the objectives of the proposals for nature conservation and protection of the historic environment are achieved. The details for specific locations will be identified by the nominated undertaker.

Explain how all post-development works (management, maintenance (including remedial action) and monitoring, as appropriate) will be ensured? Include a commitment that the monitoring, habitat management and maintenance work will be undertaken. Mechanism/s for ensuring delivery must be in place before applying for a licence (also see Section F).

The ESMPs and ECMS have been drawn up to ensure the long-term management of compensatory habitats. These cover a period of up to 50 years post-construction.

E5 Timetable of works: Please complete the **work schedule document WML-A13-a-E5a&b found on the 'bat' application form web page and append to your application pack.**

Important Advice: *Please note that from end of March 2014 a separate work schedule is a mandatory requirement to support a new bat licence application when using this template.*

F Declarations

If the mitigation/compensation area/s is/are not owned by the applicant, you must have consent from the relevant land owner(s). You must have also secured details of how any measures to maintain the population in the long term will be achieved (e.g. a legal agreement).

F1 Declaration Statement(s) – **You must <u>include</u> the following declarations within your Method Statement and include the appropriate answer (Yes/No/Not applicable):**

F1.1 **Re: section E1 -** I confirm that relevant landowner consent/s has/have been granted to accept bats into roosts or access into roosts on land outside the applicant's ownership:

Yes

F2.2 **Re: section E2 -** I confirm that landownership consent/s has/have been granted to allow the creation of the proposed compensation on land outside the applicant's ownership

Yes

F2.3 **Re: section E3** - I confirm that consent/s has/have been granted by the relevant landowner/s for monitoring, management and maintenance purposes on land outside the applicant's ownership

Yes

Comments if applicable:

N/A

Important Advice:

Unsecured consents statement:

If you have been unable to secure consents for any of the three declarations please explain why and detail any plans you have in place to obtain the consent(s) or provide details of any right(s) or agreement(s) that will enable the lawful implementation of the proposed mitigation, compensation and monitoring. Failure to provide the appropriate landowner consents means that the Method Statement is unlikely to meet the requirements for the FCS test to be met. It is therefore in your interest to ensure that the appropriate consents have been secured *before* applying for a licence.

G References: List any references cited, and include credits for source information.

H Annexes (supporting documents please append to your application pack)

H1 Pre-existing survey reports;

H2 Raw survey data.

I Check list of figures to be submitted with each Bat Method Statement

With your Method Statement and supporting documents please submit the following maps/figures – see table below. Note that some can be included within the Method Statement itself (if preferred) and others must be submitted individually (i.e. separate documents)**.** Maps/Figures must include the title, site name as referenced on your application form, date and figure reference. If a grid reference is more applicable (e.g. a bat house is being provided please included this). Include a scale bar (appropriate to the situation e.g. 100m on site maps, 1km on location maps) and direction of North etc.

Additional maps, photographs or diagrams should be included where necessary to adequately explain the scheme.

Figure reference	**Mandatory as will be included in the annexed licence, if applicable**	**Mandatory for assessment purpose only, but will not be included in the annexed licence**	**What it must show (also see details above on site reference, dating and naming).**
Figure B2.1	-	Yes, if the application is part of a phased or multi-plot development	**Master plan overview-** note – this is not the same as a master plan document, for which you should follow the guidance as stated in section B2.1.
Figure B2.2	-	Yes, if applicable	**Locations of other nearby bat licensed sites, or sites which will be impacted on by future development.**
Figure C5a	-	Yes	**Location map** at an appropriate scale for the application (often 1:50,000 or 1:25,000)

Figure C5b	-	Yes	**Survey area** showing all buildings, structures and habitats that are within the survey area and distinguishing those that were surveyed and those that were not. Indicate where surveyors were located. Aerial photographs should be provided where possible (ensure you have permission to use copy righted maps). If automated detectors were used or transect routes, ensure that these are indicated as appropriate.
Figure C6	-	Yes	**Survey results -** provide clear, annotated and cross-referenced maps/plans/photographs to show the survey results (access points, location of roosts, flight lines, results of activity surveys where DNA samples were taken etc).Ensure Figure is at a suitable scale to show the results.
Figure D	**Yes**	-	**Impacts plan –** map/figure which must show all structures or habitats (clearly referenced) that will be disturbed, damaged or destroyed, detailing where the roosts and access points are.
Figure E2	**Yes** – but only if applicable to the application	-	**Non-standard capture and exclusion apparatus.** If these are proposed please include diagrams/photographs.
Figure E3	**Yes**	-	**Specifications for mitigation / compensation** (including all dimensions for bat lofts/houses/stand-alone structures and materials to be used etc and 8-figure grid reference). Mitigation / compensation (must show all habitat creation, restoration, boxes). It may be necessary to submit more than 1 figure if the proposal is large or complicated.
Figure E4	**Yes** – when monitoring and maintenance will be included in the licence	-	**Monitoring, management and maintenance map.** Please indicate the specific structures and habitat that are to be managed, maintained and monitored as part of this licence proposal. Ensure that they are correctly referenced and are consistent with other parts of the Method Statement and figures.

Definitions of roost types to be included in the application (further detail can also be found in the Bat Mitigation Guidelines and the BCT's "Bat Surveys Good Practice Guidelines"):

a. **Day roost**: a place where individual bats, or small groups of males, rest or shelter in the day but are rarely found by night in the summer.

b. **Night roost**: a place where bats rest or shelter in the night but are rarely found in the day. May be used by a single individual on occasion or it could be used regularly by the whole colony.

c. **Feeding roost**: a place where individual bats or a few individuals rest or feed during the night but are rarely present by day.

d. **Transitional / occasional roost**: used by a few individuals or occasionally small groups for generally short periods of time on waking from hibernation or in the period prior to hibernation.

e. **Swarming site**: where large numbers of males and females gather during late summer to autumn. Appear to be important mating sites

f. **Mating sites**: sites where mating takes place from later summer and can continue through winter.

g. **Maternity roost**: where female bats give birth and raise their young to independence.

h. **Hibernation roost**: where bats may be found individually or together during winter. They have a constant cool temperature and high humidity. Sites where hibernating bats have been confirmed by appropriate survey effort should be classed as '**hibernation confirmed**'.

i. **Satellite roost**: an alternative roost found in close proximity to the main nursery colony used by a few individual breeding females to small groups of breeding females throughout the breeding season.

j. **Other** – please explain what the roost type is if not one of the above (we recognise that roost types are interchangable and not always easy to classify according to the nuances of certain species).

k. An **'alternative roost'** shall include: a purposely installed bat box; an existing roost which will not be impacted by the works; or other new/enhanced roosting opportunities. Any alternative roost must be suitable for the species, within or close to the existing roost and free from additional disturbance or development pressure.